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IX

MISCELLANEOUS STUDIES IN THE ELATERIDÆ AND RELATED FAMILIES OF COLEOPTERA

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These studies were commenced many years ago for the purpose of straightening out some of the confusion which has existed with regard to a number of our species. Many of the North American Elateridæ are extremely variable, differing within the range of the species in size, form, sculpture, and coloration. In some species great sexual differences also exist. Other species split up into many geographical races, the extremes of which are often very different. Nowhere is this plasticity more marked than on the Pacific Coast. As a result we have in this territory many variable species, species presenting many color phases within their area of distribution; many species with well marked races, each race more or less limited to a definite territory; and many closely allied though sharply defined species.

A large amount of material has of necessity been assembled in order to make the studies of any value. Among this material many undescribed species have been found which are here defined. The arrangement and generic terminology are in general that used by Schenkling in Junk's Coleopterorum Catalogus. When discussing species in genera which have been rather recently reviewed, I have not felt that it was necessary to give a synopsis or a bibliography, but in those genera that I have studied which have not been revised for many years, I have given both synoptic tables and bibliography.

Family MELASIDÆ (EUCNEMIDÆ)

Genus **Hypocœlus** Eschscholtz

SYNOPTIC TABLE

1. Terminal segment of the antennæ very little longer than the preceding, a distinct transverse ridge on the front, clypeus concave .... *frontosus* (Say)
   Terminal segment of the antennæ longer than the preceding 2
2. Terminal segment of the antennæ in the male as long as the ninth and tenth combined; front with a fine longitudinal carina, clypeus flat .... *terminalis* Lec.
   Terminal segment of the antennæ in the male longer than the preceding four segments combined; front without carina, clypeus flat .... *californicus* n. sp.

Hypocœlus californicus Van Dyke, new species

Form moderately elongate, narrowed behind; rufopiceous, antennæ and underside rufous, legs lighter; sparsely clothed with fulvous pubescence. Head convex, rather densely, coarsely punctured, front without carina, clypeus flat, narrower at base than the distance to the eyes; antennæ extending slightly beyond hind angles of prothorax, segment two small, apically transverse, segment three cylindrical, twice as long as broad, longer than two and as long as four and five together, segment four longer than broad, segments five and six as broad as long, segments 7–10 transverse, segments 4–7 triangular, 8–10 subquadrate, and segment eleven longer than the preceding four segments united and almost one-third the length of the entire antennæ. Prothorax wider than long, gradually narrower in front, sides nearly straight, slightly arcuate near the front angles; disk moderately convex, densely, rather coarsely punctured, median longitudinal impression feeble at base, a slight circular impression on each side of the middle. Elytra finely striate, punctures of striæ vague, the intervals flat and finely, rather sparsely punctured, the punctures to a certain extent in rows. Beneath, prosternum rather closely punctured, the propleuræ more coarsely and sparsely, the mesosternum less coarsely and sparsely, and the abdomen very finely and densely punctured. Hind coxal plates triangular, gradually dilated inwardly, the hind margin straight. Length 6 mm., breadth 1.5 mm.

This species looks much like *terminalis* Lec., but the great length of the terminal segment of the antennæ in the male will readily separate it. The hind coxal plate is also gradually dilated inwards and triangular whereas in the other it is rather suddenly dilated inwards.

Holotype: No. 3106, Mus. Calif. Acad. Sci., a unique male in my collection, collected at Boneyard Meadow, **Sierra National Forest, Calif.**, July 28, 1914, by Mr. Robert E. Burton, from red fir, *Abies magnifica* Murr.

Hypocœlus terminalis Lec. has also been taken on the Pacific Coast. I have seen a male, collected by Mr. Henry Dietrich, July 21, 1920, near Chiquito Creek, alt. 4100 ft., Madera Co., Calif., and there is also another male in the Koebele Collection in the California Academy of Sciences, taken at Easton, Washington.

Family ELATERIDÆ

Adelocera Latreille

Adelocera maculata LeConte

In the recent Leng Catalogue this species is placed as a synonym of *A. modesta* Boisd. It is a very distinct species and widely separated from *modesta,* the latter being distinctly striato-punctate, the former without evident striæ and with the punctures densely and irregularly placed. Besides *maculata* is a northern species, the other a southern one which is only listed in our works because it was supposedly found in Lower California.

Adelocera mexicana Candeze

This species should be added to our list. Two specimens were taken by Dr. Lutz at Kits Peak, Rincon, Baboquivari Mts., Ariz., Aug. 1-4, 1916, and are now in the collection of the American Museum of Natural History, New York. Like *A. modesta* Boisd., it has its elytra punctato-striate. It is a much larger species, though, being 20-24 mm. in length and more cylindrical.

Genus **Conoderes** Eschscholtz (*Monocrepidius* Eschscholtz)

The genus *Conoderes* Esch., I accept in its broadest sense. *Heteroderes* Latr. differs from it only as regards the double type of pronotal punctation and in this regard is closely approached by a number of typical *Conoderes.* Together they possess a number of well marked characters as well as a common facies which separate them definitely from all other genera. Their biology and distribution are also similar. For these reasons I, therefore, believe that *Heteroderes* should be considered as but a subgenus of the other and I will so treat it here.

Synoptic Table

1. Pronotum with single type of punctation.............. *Conoderes* Esch. (*Monocrepidius* Esch.), sens. str........................ 2

   Pronotum with double type of punctation, the interspaces between the larger punctures very finely punctured.................................... subgenus *Heteroderes* Latr. 20

2. Fourth tarsal segment strongly or broadly lamellate beneath, the lamella visible from above, large or moderate sized species 3

   Fourth tarsal segment with long and slender lamella beneath, the lamella not visible from above, small species, less than 8 mm. in length, in general castaneous with head, two pronotal vittæ, a series of longitudinal lines more or less transversely united on elytra, and much of ventral surface piceous (in extreme forms most of the castaneous area has been replaced by the piceous).. 17

3. Intermediate antennal segments almost as broad as long, prothorax as broad as long at middle, large and broad species, 17 mm. long, reddish above with median longitudinal black stripe on pronotum, a black spot on either side and several black spots on each elytron. Texas..............*xysticus* (Cand.)

   Intermediate antennal segments almost twice as long as broad, prothorax generally longer than broad.................. 4

4. Species more or less unicolorous above...................... 5

   Species which are always distinctly bicolored above........... 13

5. Hind angles of prothorax acute and distinctly produced posteriorly.. 6

   Hind angles of prothorax abruptly truncate, hardly produced beyond hind margin of prothorax....................... 11

6. The inner carina of hind angles of prothorax absent or at most indistinct, elytral apices evenly rounded.................. 7

   The inner carina of hind angles of prothorax sharply defined, elytral apices incised and bidentate.................... 12

7. Larger species, 10 mm. or more in length................... 8

   Small species, not longer than 5 mm....................... 10

8. Dorsal carina of hind angles of prothorax close to and almost parallel with lateral margin, species light brown or brownish ferruginous with rufous antennæ and flavous legs, the pronotum very finely, closely punctured. Eastern North America...................................*lividus* (De Geer)

   Dorsal carina of hind angles of prothorax diverging slightly though distinctly from lateral margin as it extends forward.. 9

9. Species quite similar to *lividus* but darker, of a chocolate brown color with rufous antennæ and flavous legs, more parallel and with pronotal punctation considerably coarser though close. Ariz. and Mex.........................*parallelus* (Cand.)

   Species narrow and elongate, prothorax much narrowed anteriorly in male, color ranging from brown to ferruginous with legs but little lighter than body, the pronotum rather finely punctured but with the punctures distinctly separated, the second antennal segment but little longer than third (nearly twice as long in the preceding two species). Ariz. and N. M.......................................*athoides* (Lec.)

10. Very elongate and narrow, rufotestaceous with elytral suture darker, prothorax nearly twice as long as wide, disk densely and rather finely punctured, hind angles not carinate, second and third antennal segments of about equal length. Fla. *debilis* (Lec.)

11. Elongate, subparallel, pale brown, legs flavous, pronotum moderately coarsely and closely punctured, hind angles unicarinate, elytral apices bidentate; length 9 mm. Tybee Is., Ga..*scissus* (Schfr.)

12. Robust, somewhat flattened, narrowed posteriorly, piceous brown, antennæ rufous, legs flavous, prothorax broad, very finely, closely punctured, hind angles strongly bicarinate; length 10 mm. Southern Ariz..................*bicarinatus* n. sp.

13. Dorsal carina of hind angles of prothorax distinctly diverging anteriorly from lateral margin, the sides almost straight in front of hind angles, second antennal segment but little longer than broad.................................. 14

    Dorsal carina of hind angles of prothorax close to and almost parallel with lateral margin, diverging but little anteriorly, the sides distinctly sinuate in front of hind angles, second antennal segment considerably longer than broad......... 15

14. Pronotal punctures very fine and dense, not readily seen, third antennal segment much longer than second, color above varying from all piceous except the hind portion of pronotum which is flavous, to flavous with piceous markings as follows, the base of head, two broad discal pronotal vittæ and two elytral vittæ, a narrow marginal and broad sutural, the latter dilating apically and uniting with the preceding. Ga., Ala. and Fla. to Central America...............*aversus* (Lec.)

Pronotal punctures moderately fine and dense, readily observed, third antennal segment hardly longer than second, color varying from rufocastaneous with base of head, two pronotal vittæ, and a broad sutural vitta suddenly expanded before the apex, piceous, to rufocastaneous with but the sutural vitta or even only a scutellar and two transverse apical markings. Southern Ariz. to Colombia......*varians* (Steinh.)

15. Species over 7 mm. in length, pronotum moderately finely, closely punctured, outer segments of antennæ narrower than intermediate, color castaneous including scutellum and entire ventral surface, with base of head, two broad frontal vittæ, a narrow marginal and broad sutural vitta, the latter gradually broadened basally and suddenly expanded before apex to meet the lateral, piceous. Eastern North America...... ....*vespertinus* (Fab.)

Species under 6 mm. in length............................ 16

16. Prothorax dilated at middle, narrow anteriorly, disk rather coarsely, sparsely punctured, outer segments of antennæ broader than intermediate, color testaceous or rufotestaceous, the head, narrow median pronotal vitta, scutellum, circumscutellar area and narrow sutural vitta, expanded moderately posteriorly, and entire under surface back of prothorax, piceous. Ala., Ind.............................*suturalis* (Lec.)

Prothorax elongate, subparallel, disk finely, densely punctured, color pattern similar to preceding except that entire undersurface is testaceous. Ga.........................*lepidus* (Lec.)

17. Species 5 mm. or over in length.......................... 18

Species 4 mm. or less in length.......................... 19

18. Pronotum moderately coarsely, closely punctured, slightly finer posteriorly, robust species. Eastern North America.*auritus* (Herbst.)

Pronotum punctured with intermixed larger and smaller punctures, elongate species. Ga......................*blandulus* (Lec.)

19. Distinct carina near prosternal sutures. Eastern North America ....*bellus* (Say)

No carina near prosternal sutures. Southern Tex........*similis* (Schfr.)

20. Species over 7 mm. in length............................ 21

Species under 6 mm. in length............................ 23

21. Hind angles of prothorax unicarinate........................ 22
    Hind angles of prothorax bicarinate and sides parallel; general form depressed, color piceous with legs and antennæ pale; third segment of antennæ twice length of second and shorter than fourth, outer segments feebly serrate; length 8.2. Jacksonville, Fla............................... *nicholsi* (Notman)

22. Pronotum with disk evenly convex, sides arcuate, carina near hind angles close to and almost parallel with side margin, scutellum angulate or tuberculate in front, elytra elongate elliptical, color dirty brown with antennæ and legs castaneous. Ariz. and Mex............................ *sordidus* (Lec.)
    Pronotum with disk flattened, sides almost parallel at middle, carina near hind angles diverging anteriorly from margin, scutellum flat and gradually declivous in front, elytra cuneiform, color pitchy black with antennæ and legs castaneous. Fla., Ala., and West Indies...................... *amplicollis* (Gyll.)

23. Species short and robust, carina near hind angles diverging from margin, color reddish brown. Ariz................. *robustus* (Lec.)

Conoderes bicarinatus Van Dyke, new species

Moderately elongate, somewhat depressed and broad, brownish black, the antennæ, palpi, legs, and margin of last ventral segment rufotestaceous, densely clothed with short, fine grayish pubescence. Head closely, finely, and cribrately punctured, the frontal margin but slightly arcuate; antennæ extending beyond hind angles of prothorax, second segment small, but little longer than broad, the third one-half longer, the two together not quite equal to the fourth. Prothorax wider than long, widest behind, the sides almost straight and slightly convergent from base of hind angles to near apex where broadly rounded, the hind angles strongly produced, slightly divergent, with two well defined carinæ, an outer extending from the apex to well beyond the base of the angle and slightly divergent from the margin and sinuate anteriorly, the second shorter and extending from the apex inwardly, the disk densely, finely, and deeply punctured, obsoletely canaliculate posteriorly. Scutellum large, longer than broad, and regularly declivous forwards. Elytra more than twice as long as prothorax and more than twice as long as broad, the sides rounded near humeri, thence gradually convergent towards the apex, the apices of each elytron distinctly emarginate and bluntly bidentate, disk deeply striate, the striæ distinctly punctate especially forwards, the intervals flat and finely rugulose. Fifth ventral segment evenly rounded at apex. Fourth tarsal segment rather broadly lamellate beneath. Length 10 mm., breadth 3.5 mm.

This sombre colored species can readily be separated by having the apices of the elytra emarginate and the hind angles of the prothorax distinctly bicarinate. *C. scissus* (Schfr.) is our only other species with the elytral apices bidentate, and *nicholsi* (Notman) of the subgenus *Heteroderes* the only other species with the hind angles bicarinate. It also differs from any of the species described from Mexico.

Holotype: No. 3107, Mus. Calif. Acad. Sci., a unique in my collection, collected on **Mt. Washington**, near **Nogales, Ariz.**, at an altitude of 6000 feet, July 8, 1919, by Mr. J. August Kusche.

Conoderes varians (Steinheil)

Numerous specimens of this species[1] which superficially very closely resembles the more flavous forms of *C. aversus* (Lec.) and *C. vespertinus* (Fab.), have within recent years been found in various parts of southern Arizona. It was described originally from Colombia but is found ranging through Central America and, according to Champion,[2] along the west coast of Mexico. I have specimens before me from both western Mexico and Arizona.

Conoderes (Heteroderes) amplicollis (Gyllenhal)

This species which is rather widely distributed among the West India islands should now be added to our list. It was first secured in our territory near Mobile, Alabama, by Mr. H. P. Loding and later near Dunedin, Florida, by Dr. W. S. Blatchley; the latter believing it to be new, described it as *Monocrepidius fucosus.*[3] I have a specimen of this received from Dr. Blatchley and find that it is absolutely the same as the Mobile specimens and the same as specimens from the Bermuda Islands submitted by Mr. E. P. Van Duzee, and from Soledad, Cienfuegos, Cuba, by Mr. P. J. Darlington, which agree in all details with the description given by Candeze[4] that was based upon type material.

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[1] Zur Kenntniss der Fauna von Neu-Granad, von Eduard Steinheil. Col. Hefte, vol. XIV (1875), pp. 121-122.

[2] Biol. Centr. Am., Col., vol. III, pt. 1, 1895, p. 353.

[3] Can. Ent., vol. LIII, 1925, pp. 163-165.

[4] Mon. des Elaterides, par M. E. Candeze, II, 1859, p. 372.

At first thought, I believed that this species was the *Heteroderes lantus* Cand., a species founded upon specimens supposedly captured in Alabama, but they do not fit the description of Candeze nor agree at all with *H. sordidus* Lec., with which Candeze later placed this species as a synonym. This species does, however, somewhat resemble the Mexican *H. granulatus* Champ. but can be separated from the same by having the third antennal segment but little longer than the second whereas in the other it is much longer. *H. granulatus* Champ. also has the base of the prothorax somewhat yellowish.

BIBLIOGRAPHY

Genus **Conoderus** Esch. (*Monocrepidius* Esch.)

Conoderus Esch. (Monocrepidius Esch.) sen. str.

Conoderus xysticus (Cand.) (Monocrepidius), Cand., Mon. Elat., II, 1859, p. 223.

Conoderus lividus (DeG.) (Elater), Mem. l'hist. Insect., IV, 1774, p. 162, tab. 18, fig. 13; (Monocrepidius), Lec., Tr. Am. Phil. Soc., X, 1853, p. 482; Leng Cat. Col., 1922, p. 167.
castaneus Oliv. (Elater), Ent., II, 1790, p. 30.
castanipes Hbst. (Elater), Käfer, X, 1806, p. 23.
elongatus Pal. d. Beauv. (Elater), Ins., 1805-1821, p. 78, pl. 8, fig. 4; (Monocrepidius), Chev., Ann. Soc. Ent. Fr., 1852, p. 629.
lobatus Say (Elater), Jour. Acad. Nat. Sci. Phila., 1823, p. 175; (Monocrepidius), Germ. Zeits. f. d. Ent., I, 1839, p. 228.

Conoderus parallelus (Cand.) (Monocrepidius), Mon. Elat., II, 1859, p. 246.

Conoderus athoides (Lec.) (Monocrepidius), Smiths. Misc. Coll., VI, No. 167, 1863, p. 84.
mutuus Horn (Monocrepidius), Tr. Am. Ent. Soc., III, 1871, p. 312.

Conoderus debilis (Lec.) (Athous), Proc. Am. Phil. Soc., XVII, 101, 2R, 1878, p. 405; (Monocrepidius), Henshaw List Col., 1885, p. 67.

Conoderus bicarinatus, n. sp.

Conoderus scissus (Schfr.) (Monocrepidius), Bul. Brooklyn Inst., I, 1909, p. 378.

Conoderus aversus (Lec.) (Monocrepidius), Tr. Am. Phil. Soc., X, 1853, p. 482.
scutellaris Dej. (Monocrepidius), Cat., ed. 3, 1837, p. 98.
var. *a*. elytris macula humerali testacea.
var. *b*. elytris vitta discoidali testacea.
puellus Dej. (Monocrepidius), Cat., ed. 3, 1837, p. 98.

Conoderus varians (Steinhl.) (Monocrepidius), Col. Hefte, XIV, 1875, p. 121; Champion, Biol. Cent. Am., Col., III, pt. 1, 1895, p. 353.

Conoderus vespertinus (Fab.) (Elater), Syst. Eleuth., II, 1801, p. 240; (Monocrepidius), Dej. Cat., ed. 3, p. 98; Lec., Tr. Am. Phil. Soc., X, 1853, p. 483.
finitimus Say, (Elater), Tr. Am. Phil. Soc., VI, 1839, p. 179.
serotinus Germ., (Monocrepidius), Zeits. f. d. Ent., I, 1839, p. 227.
texanus Cand. (Monocrepidius), Mon. Elat., II, 1859, p. 262.
peninsularis Cand. (Monocrepidius), Ann. Soc. Ent. Belg., XXXIII, 1889, p. 26.

Conoderus suturalis (Lec.) (Monocrepidius), Tr. Am. Phil. Soc., X, 1853, p. 482.

Conoderus lepidus (Lec.) (Monocrepidius), Tr. Am. Phil. Soc., X, 1853, p. 485.

Conoderus auritus (Hbst.) (Elater), Käfer, X, 1806, p. 145; (Monocrepidius), Germ., Zeits. f. d. Ent., V, 1844, p. 148; Lec., Tr. Am. Phil. Soc., X, 1853, p. 483.
crassicollis Melsh. (Oophorus), Proc. Acad. Nat. Sci. Phila., II, 1844, p. 214.
dilectus Say (Oophorus), in. litt.
caseyi Leng (Monocrepidius), Jour. N. Y. Ent. Soc., XXVI, 1918, p. 206.
||*finitimus* Casey (Monocrepidius), Contrib., II, 1884, p. 170.

Conoderus blandulus (Lec.) (Monocrepidius), Tr. Am. Phil. Soc., X, 1853, p. 483.

Conoderus bellus (Say) (Elater), Jour. Acad. Nat. Sci. Phila., III, 1824, p. 168; (Monocrepidius), Lec., Tr. Am. Phil. Soc., X, 1853, p. 484.
variegatus (Steinh.) (Monocrepidius), Col. Hefte, XIV, 1875, p. 123.

Conoderus similis (Schfr.) (Monocrepidius), Ent. News, XX, 1909, p. 436.
texanus Schfr. (Monocrepidius), Bul. Brooklyn Inst., I, 1909, p. 379.

Subgenus **Heteroderes** Latr.

Conoderus nicholsi (Notman) (Heteroderes), Bul. Brooklyn Ent. Soc., XVII, 1922, p. 107.

Conoderus sordidus (Lec.) (Monocrepidius), Tr. Am. Phil. Soc., X, 1853, p. 482.
lantus Cand. (Monocrepidius), Ann. Soc. Ent. Belg., XXXIII, 1889, p. 31.

Conoderus amplicollis (Gyll.) (Elater), *in* Schön. Syn. Ins., I, Append., 1833, p. 141, 194; (Heteroderes), Cand. Mon. Elat., II, 1859, p. 372.
fucosus (Blatch.) (Monocrepidius) Can. Ent., LVII, 1925, pp. 163–164.

Conoderus robustus (Horn) (Monocrepidius), Tr. Am. Ent. Soc., III, 1871, p. 311.

Conoderus puberulus Mann. (Monocrepidius), Leng Cat. Col., 1920, p. 167. =*Anchastus cinereipennis* (Esch.) (Monocrepidius), Thon., Ent. Archiv., II, 1829, p. 31.

Genus **Elater** Linnæus

The genus *Elater* should be made to include *Ectamenogonus* Buysson. The latter, made to include the species having the hind angles of the prothorax bicarinate, is not founded upon a sound character. In the first place the assemblage is not phylogenetic, the character being an erratic one which may appear here and there in the group. It is also an unstable character, for it may or may not be present in all of the individuals of a species. It is of value for the purpose of separating certain species from their fellows, but no more.

Elater sturmii Germar

This species should be restored. It was omitted in the Leng Catalogue. It is a true *Elater* as observed by LeConte, not a *Megapenthes* and a synonym of *granulosus* as he formerly believed.

Elater ursinus Van Dyke, new species

Elongate, subcylindrical; piceous brown, the mouthparts, antennæ, and legs rufous, the undersurface rufopiceous; and densely clothed with short, coarse, suberect, grayish brown pile. Head coarsely, closely punctured; the antennæ reaching the apex of hind angles of prothorax, the second segment short, but slightly longer than broad, the third segment slightly longer than second and about two-thirds length of fourth, segments 4–10 distinctly serrate. Prothorax slightly broader than long, sides somewhat sinuate in front of hind angles, thence arcuate and convergent forwards and abruptly rounded near front margin, the hind angles moderately prominent, subacute, with a well defined carina extending obliquely inwards from apex, and a poorly defined one between this and the lateral margin; the disk quite convex, rather coarsely and closely punctured, especially at sides, and with a slight median canaliculation at basal half. Elytra about three times the length of prothorax and slightly more than twice as long as broad, with sides quite parallel to apical third, then gradually rounded to apex; disk convex, the striæ rather coarsely and closely punctured towards base, more finely posteriorly, the intervals convex and finely punctured and scabrous. Beneath with the prosternum broad, but slightly convex, the anterior lobe not long and finely and sparsely punctured, the propleuræ and mid-portions rather coarsely and closely punctured, the abdomen rather finely punctured. Length 8.5 mm., breadth 2.75 mm.

Holotype: No. 3108, Mus. Calif. Acad. Sci., and *Paratype* in my collection, taken at **Fallen Leaf Lake, Lake Tahoe, Calif.,** July 4, 1915, and July 22, 1915. A third specimen from the same locality has the abdomen entirely red. A fourth, from Easton, Washington, has been seen.

This species belongs near *melsheimeri* Leng *(hepaticus* Mels.) but differs from that as from others associated with it by being more cylindrical and generally smaller. It also has the second and third antennal segments proportionally shorter, the pile coarser and more elevated, and is different in color. The species is somewhat variable in color, the apical and basal margins of prothorax and the basal margin of elytra being rufous in some specimens, and in one the entire under surface is a bright red as normally is the case with *rhodopus* Lec. If the recently created genus *Ectamenogonus* Buysson were recognized, this species would have to be placed in it.

Elater fenyesi Van Dyke, new species

Similar and closely related to the preceding but differing in the following regards: the head, pronotum, antennæ, legs, and entire under surface a bright red; the pronotum more coarsely and closely punctured; the elytra with the striæ very fine and finely punctured, especially posteriorly, the intervals flat and much smoother posteriorly than basally, with the prosternum much narrowed and more convex, coarsely and rather closely punctured, and with the anterior lobe long.

Holotype: No. 3109, Mus. Calif. Acad. Sci., a unique in my collection, collected at **Bishop, Calif.,** June 16, 1905, by Dr. A. Fenyes. Other specimens are in the Doctor's collection.

I at first took this species to be but an extreme phase of *ursinus* but found the prosternum so different in every way that I could not do otherwise than consider it as distinct.

Elater rhodopus LeConte

There is a race of this well known species found in the Wasatch Mts. of Utah which is in general shorter and blunter, less shining, with head and pronotum more finely and closely punctured, the outer carina of the hind angles of the prothorax quite vague in contrast to the rather sharply defined ones of the typical form, the elytra with the striæ deeper, the intervals more convex and more coarsely punctured, and the greater portion of the under surface more or less piceous instead of bright red. This, I am calling the subspecies **uteanus** and designating as a holotype (No. 3110, Mus. Calif. Acad. Sci.), and paratypes, a series of six specimens collected in **Provo Cañon, Wasatch Mts., Utah,** May 21, 1913, by Mr. J. R. Slevin. Two other specimens in the California Academy collection were taken in the same region by Mr. E. P. Van Duzee.

Elater rubriventris LeConte

Typical specimens of *Elater sanguinicollis* Schaeffer from Stockton, Utah, when compared with typical specimens of *rubriventris* from New Mexico and Arizona show that they are one and the same species. This is a species ranging throughout the more mountainous portions of the southern part of the Great Basin.

Elater cordifer LeConte, and associates

The members of the *cordifer* group were in certain cases so widely separated in the synoptic table given by LeConte[5] that their recognition was rendered difficult. I believe that they form a definite group and should be treated as such so am taking advantage of the opportunity while describing a number of new species in the group, to give a table which I hope will enable them to be better identified. All species are represented in my collection and by good series except in a few cases. In regard to the LeConte and Horn species, I have specimens which have been very carefully compared with the types so feel quite sure of the determinations. The species of *Elater* which I have associated with *cordifer* are characterized

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[5] Short Studies of North American Coleoptera (No. 2), by John L. LeConte, M. D. Tr. Am. Ent. Soc., XII, 1884, pp. 8-11.

in general by having the body black, the basal portion of the elytra of a rich orange or reddish orange color, the antennal segments 4–10 decidedly serrate, the prothorax with the hind angles unicarinate, the notum more or less densely punctured, and the entire upper surface clothed with a somewhat dense yet short, semierect pile, longer and more erect on the pronotum. With the exception of *apicatus,* all are restricted to the Pacific area. *Elater pullus* Germ. might, because of its color pattern, seem to belong in the group but its sculpturing as shown by its sparse pronotal punctation would place it without the pale.

Synoptic Table

Cordifer group of Elater Linnæus

1. Pubescence of pronotum black or at least black on disk........ 2
Pubescence of pronotum yellow or grayish yellow............. 7

2. Apical elytral patch more or less cordiform.................. 5
Apex of elytra uniformly black, the anterior margin of black patch quite transverse.................................. 3

3. Pronotum subopaque, bluish black, very densely, umbilicately, punctured, pubescence coal black and quite erect, apical third of elytra or over uniformly black, the basal area reddish orange, specimens in general proportionately broader and more flattened than other members of the group; length 8-9 mm. Middle Sierra of Calif. and Great Basin, ranges from Ariz. to B. C..................................*phelpsi* Horn
Pronotum shining, punctures not umbilicate nor approximate.. 4

4. Pronotal pubescence black and semierect, apical black patch of elytra not reaching the middle; length 6-9 mm. High middle Sierra of Calif...*horni* Cand.
Pronotal pubescence much inclined, apical black patch of elytra variable, generally extending beyond middle; length 8.5-9 mm. Southern Ore............................*dimidiatus* Lec.

5. Apical black patch touching sides for some distance in front of apex.. 6
Apical black patch touching sides only close to apex, the yellow area extending backwards along suture beyond frontal margin of black area, pubescence over yellow area, yellow; moderately large species; length 10 mm. or over. Most of Calif..*cordifer* Lec.

6. Black patch of elytra slightly separated anteriorly by intrusion of yellow, pubescence of pronotum black on disk and fulvous at sides near hind angles; length 9 mm. or less. B. C. to mountains of middle Calif. . . . . *varipilis* n. sp.

Black patch of elytra extending forwards along suture, pubescence black over entire pronotum; length 10 mm. or over. Western Wash., south near coast to Sonoma County, Calif. . . . . *behrensi* Horn

7. Elytra entirely orange, without black apical patch 11

Elytra with black apical patch 8

8. Pronotum somewhat subopaque, rather closely punctured, pubescence fulvous, black elytral patch in touch with margin for some distance in front of apex; length 9 mm. or less 9

Pronotum rather shining, punctures somewhat separated, pubescence grayish yellow, black elytral patch not touching sides or touching only near apex; length 10 mm. or more 10

9. Prothorax with sides almost parallel at basal half, broadly rounded in front, pronotal pubescence suberect, antennæ barely reaching hind angles of prothorax; length 9 mm. (in a few specimens the apical black patch is vague). Marin and Sonoma counties, Calif., on Douglas fir, *Pseudotsuga*. A coastal species . . . . *cordatus* Horn

Prothorax with sides converging from base to apex and but slightly arcuate, pronotal pubescence much inclined, antennæ distinctly extending beyond hind angles of prothorax; length 7-8 mm. Middle and northern Sierra of Calif. on yellow pine. (Washington *vide* LeConte) . . . . *affinis* Lec.

10. Apical elytral patches limited to each elytron and not reaching suture, sides or apex; pronotal pubescence suberect, elytral pubescence black throughout; length 9-10 mm. B. C. south to Sierra of middle Calif. . . . . *bimaculatus* n. sp.

Apical elytral patch cordiform, united along suture and reaching apex and sides for a short distance near apex (in a few cases the patch extends forward parallel to suture almost to base of elytra); pubescence of both pronotum and elytra much inclined; length 10-13 mm. Northern United States and Canada from Atlantic to west of Great Lakes . . . . *apicatus* Say

11. Pronotum more coarsely and closely punctured than in case of preceding, prothorax also more broadly rounded in front and elytra less narrowed and less cuneate posteriorly; length 8-14 mm. This species is most decidedly not a variety of *apicatus* as generally listed. B. C., Pacific States and northern Rocky Mountains . . . . *phœnicopterus* Germ.

Elater phelpsi Horn

This very beautiful and rather rare *Elater* is to be found in its typical form and color throughout the higher levels of the middle and northern Sierras of California. The brilliant reddish yellow color of the base of the elytra and the coal black, heavily punctured pronotum readily separate it from its fellows. In the mountains of Arizona, there is a phase that is smaller with the base of the elytra a distinct orange color, while in British Columbia still another phase occurs that has the pronotum more finely and not umbilicately nor approximately punctured, with fulvous pile instead of black, and with the apical black patch of the elytra quite cordiform. This latter phase is so distinct that I have designated it as the subspecies **hoppingi.** My Holotype (No. 3111, Mus. Calif. Acad. Sci.) was collected by Mr. Ralph Hopping in Midday Valley, **Merritt, British Columbia,** July 12, 1923. Paratypes are in Mr. Hopping's collection.

Elater varipilis Van Dyke, new species

Elongate, subcylindrical; black, elytra orange except for a cordate black patch, the orange extending along the sides almost to the apex and on the suture at least half way through the black area, the antennæ rufopiceous and the tarsi rufous; surface moderately, finely pubescent, the pile suberect above, black on discal area of pronotum and on black areas of elytra, golden yellow to a slight extent on head, sides of pronotum behind, basal area of elytra and beneath. Head moderately coarsely, densely punctured; antennæ not reaching hind angles of prothorax, third segment one-half longer than second, subcylindrical, 4-10 distinctly serrate, the fourth slightly the longest and almost as long as broad; prothorax slightly broader than long, sides sinuate in front of hind angles, slightly arcuate in front and narrowed near apex, hind angles unicarinate, disk similarly punctured to head anteriorly, more finely and sparsely posteriorly, and quite shining. Elytra distinctly more than twice as long as prothorax and twice as long as broad, the sides gradually narrowing posteriorly, more suddenly at apex, the disk with striæ distinctly impressed and rather coarsely, closely punctured almost to apex, the intervals but slightly convex, finely punctured and rugose. Beneath moderately coarsely but not closely punctured anteriorly, more finely posteriorly. Length 9 mm., breadth 2.75 mm.

Holotype: No. 3112, Mus. Calif. Acad. Sci., and numerous *Paratypes* in my collection, the first from **Strawberry Valley,** Eldorado County, California, collected by myself August 5, 1912, the rest from mid-Sierran localities. My series consists of 57 specimens ranging from British Columbia through western Washington and Oregon and down the Cascade and Sierra Nevada Mountains to the Yosemite Valley.

This species in size and general appearance closely resembles *Elater cordatus* Horn and no doubt in most collections is placed there. *Elater cordatus* Horn, of which I have typical specimens from the type locality and checked with the type, differs in the fact that the pile of the head and pronotum is much finer and entirely yellow, the prothorax with sides more parallel posteriorly, the disk more opaque, the third segment of the antennæ but little longer than the second and the elytra less cuneate. In general also the yellow of elytra does not have a tendency to extend along the suture so far posteriorly. The most evident character to use for their separation is the color of the pile on the pronotum, black on the disk and yellow at sides near hind angles in *varipilis* and yellow throughout in *cordatus*.

Elater bimaculatus Van Dyke, new species

Elongate, parallel sided; black, elytra orange except for an elongate black maculation near apex of each elytron which does not reach suture, sides or apex, the tarsi rufous and apices of antennæ somewhat so; surface moderately, finely pubescent, suberect above and golden yellow on head, pronotum and sides of elytra near humeri, elsewhere on elytra black, beneath yellowish, sparser, shorter and appressed. Head moderately, coarsely, not closely punctured, more in front; antennæ reaching hind angles of prothorax, second segment one-half longer than third and somewhat triangular, segments 4-10 decidedly triangular but longer than broad, the basal the broadest. Prothorax slightly broader than long, sides perceptibly sinuate in front of hind angles, slightly arcuate at middle and rather distinctly narrowed to apex, hind angles unicarinate, disk quite convex, very shining, and moderately coarsely but not closely punctured. Elytra two and one-half times as long as prothorax and two and one-half times as long as broad, breadth equal to that of prothorax, sides almost straight and parallel anteriorly, just perceptibly sinuate at middle, gradually rounded and convergent to apex, the disk with striæ moderately impressed and finely, rather closely punctured, the intervals flat except near apex, shining, very finely punctured and but slightly rugose. Beneath moderately coarsely but not closely punctured anteriorly, more finely on posterior ventral segments. Length 10 mm., breadth 2.75 mm.

March 3, 1932

Holotype: No. 3113, Mus. Calif. Acad. Sci., and numerous *Paratypes* in my collection, the first captured by me at **Fallen Leaf Lake, Lake Tahoe, Calif.**, July 1, 1915, the others from various points in the mountains of northern California. In my series are about fifty specimens, and I have seen many more, which range from British Columbia and western Montana south through Washington and Oregon to the southern Sierras of California. It is found in the main beneath the bark of dead fir.

The distinctive peculiarities of this member of the *cordifer* group is that it is the most elongate, most parallel and proportionately narrowest member, and that the apical black patches of the elytra are distinctly isolated, neither touching each other, the suture, nor the margin at any point. From *cordatus* and *affinis* which both have the pile of the pronotum yellow, it is readily separated in addition to the characters mentioned above by having the pronotum shining and the punctures well separated, whereas the pronotum is subopaque in those species and rather finely, closely punctured.

Elater brunneicolor Van Dyke, new species

Size, form and general color of *Elater manipularis* Cand., brown passing into rufous at margins, basal margin of elytra yellow, the antennæ and legs rufous; surface clothed with moderately coarse, yellowish brown pile, somewhat erect on dorsum. Head coarsely, rather closely punctured; antennæ reaching a segment and a half beyond hind angles of prothorax, third segment one and a half times as long as second and cylindrical, segments 4-10 distinctly serrate, the fourth one-third longer than broad, the outer ones somewhat narrower. Prothorax as wide as long, sides just perceptibly sinuate in front of hind angles, but slightly arcuate and convergently narrowed anteriorly, hind angles unicarinate, disk rather finely, sparsely punctured posteriorly, more coarsely and closely at sides and towards apex. Elytra almost three times as long as prothorax and three times as long as broad, sides parallel in front, gradually rounded posteriorly to apex, disk rather finely striate, the striæ finely, closely punctured with elongate punctures, the intervals flattened, shining and very finely punctured. Beneath rather coarsely, closely punctured in front and gradually more finely and sparsely behind. Length 9 mm., breadth 2.5 mm.

Holotype: No. 3114, Mus. Calif. Acad. Sci., collected by myself at **Forest Home, San Bernardino County, California,** June 18, 1928, *Paratypes* from Mt. Wilson, Los Angeles

County, California, and Forest Home, San Bernardino County, California. Of the fourteen specimens which I have before me, all are from southern California except two from the Santa Cruz Mountains, one from Oroville, and one from Placer Co., California. They also show considerable variation as to color from brown to rufotestaceous, in size from 7–9 mm. in length, and as regards the coarseness of pronotal punctation and distinctness of elytral striæ. Several typical specimens in the collection of Dr. F. E. Blaisdell have also been examined.

This species superficially looks very much like *Elater manipularis* Cand. as stated previously. It differs from that by having the median segments of the antennæ definitely serrate, the same segments in *manipularis* being only slightly enlarged apically and by having the pile coarser and more erect on the dorsal surface. From *Elater longicornis* Lec., a brown species which is found in its territory, it differs by being much shorter, by having its prothorax as long as wide, whereas in *longicornis* it is distinctly broader than long, by having shorter antennæ, the antennæ in the latter extending at least three segments beyond the hind angles of prothorax, and also by having the median segments more serrate.

Elater brevis Van Dyke, new species

Short, compact, black, sides, hind angles and outer part of base of prothorax rufous, elytra rufotestaceous with a vague fuscous patch along suture near apex, the antennæ and legs reddish with femora slightly piceous; surface sparsely pilose, the pile but little elevated even on upper surface. Head rather finely and sparsely punctured; the antennæ only reaching the base of the hind angles of prothorax, third segment a third longer than second and hardly dilated apically, fourth segment almost as long as second and third together, segments 4-10 serrate but about one-third longer than broad. Prothorax slightly broader than long, sides almost parallel in front of hind angles, gradually arcuate and anteriorly narrowed to apex, hind angles unicarinate, disk slightly convex, finely yet distinctly and not closely punctured. Elytra slightly more than twice as long as wide and almost three times as long as prothorax, sides almost parallel anteriorly, gradually rounded and narrowed to apex, the disk with striæ well defined and rather finely, closely punctured, the intervals quite flat, finely punctured and finely transversely rugose. Beneath moderately coarsely, not closely punctured anteriorly, much more finely punctured on ventral segments. Length 8 mm., breadth 2.75 mm.

Holotype: No. 3115, Mus. Calif. Acad. Sci., a female collected by myself in **Paradise Valley, Mt. Rainier, Washington,** July 15, 1920; *Paratype,* a smaller specimen, from Moscow Mt., Idaho, May, identical in all essentials with preceding. A third specimen is entirely black except hind angles and a narrow lateral margin to prothorax, both above and beneath, which are rufous, a rufous cast to the humeral region of elytra and rufous antennæ and legs. It was collected on Red Mountain, Nevada Co., Calif., July 3, 1911, by Dr. Chas. Von Geldern. A number of other specimens from eastern British Columbia have also been submitted to me for determination by Mr. Ralph Hopping. He reports that he has "six specimens, two from Trinity Valley, which is just east of Vernon, two from Copper Mountain, near the International Boundary, one from Vernon and one from Williams Lake, which is in the Caribou District, about sixty miles north of the C.P.R."

This species, which suggests some of the species of *Drasterius,* both because of the form and coloration, would run in the LeConte table, close to *pullus,* where it most probably belongs. It is of the same stocky build, but larger and differently marked. It seems to show no relationship whatever to any of our other species.

Genus **Megapenthes** Kiesenwetter

The genus *Megapenthes* is quite polymorphic yet the species in general appearance and in most structural details are much like those of *Elater*. They all differ fundamentally, however, by having the sutures of the prosternum not excavated in front between the sternum and the flanks, and in addition also are distinguished by the following characters of lesser moment: prosternum concave or channeled between the front coxæ and the inner portion of the posterior coxal plates, not suddenly expanded but gradually dilated, though often markedly broad as compared with the outer portion. In most of our species both the second and third antennal segments are small and in a number the antennæ of the males are ornamented with rather long erect hair in addition to the usual pile. The genus is world wide in distribution with the bulk of the species in the warmer parts of the world, while *Elater* is mainly Holarctic. In the United States there are but few species while in Mexico and the countries to the south they are far more abundant.

There is much confusion in the literature concerning the status of our species. For instance, Otto Schwarz in Genera Insectorum, places *tartareus, aterrimus* and *limbalis* in the genus *Trichophorus.* As stated by Schaeffer,[6] these most decidedly do not belong there but in *Megapenthes. Elater sturmii* Germ. was at one time believed by LeConte to be the same as *granulosus,* now recognized as but the female of *Megapenthes limbalis* (Hbst.). Later, however, he[7] discovered that they were two distinct species and placed *sturmii* where it truly belongs in the genus *Elater.* In the Leng Catalogue, there are also several errors as regards the synonymy. *Megapenthes aterrimus* Horn is a true synonym of *Dolopiosomus aterrimus* Mots., not the latter a synonym of *Megapenthes tartareus* (Lec.), therefore the name *horni* as a substitute for *aterrimus* Horn is unnecessary. The corrected bibliography will be found following the discussion of the species.

Synoptic Table

1.	Hind angles of prothorax unicarinate........................	2
	Hind angles of prothorax bicarinate........................	17
2.	Opaque, very densely punctured; antennæ strongly serrate, segments 2-3 small, in the male outer segments with stiff erect hairs; large and robust species........................	3
	Somewhat shining, less densely punctured; antennæ but moderately serrate; smaller and more linear species...........	6

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[6] Jour. N. Y. Ent. Soc., XXIV, 1916, p. 26.

[7] Trans. Am. Ent. Soc., XII, 1884, p. 9.

3. Pubescence entirely black.................................. 4

Pubescence brown or variegated.............................. 5

4. Prosternal lobe subtruncate in front, prosternum but moderately broad between coxæ and slightly channeled; abdomen rather coarsely punctured; color dull black, legs sometimes dark red; distinctly narrowed in front as well as behind; length 9.5-11 mm. Ore., Calif., more common south and inland ....*tartareus* (Lec.)

Prosternal lobe arcuate in front, prosternum as broad as long between coxæ and deeply channeled; abdomen rather finely, densely punctured; color dull black, sometimes with white spot near apex of each elytron; stouter species than preceding, blunter both in front and behind; length 9-16 mm. Calif. and N. M..............................*aterrimus* (Mots.)

5. Similar in structure to *aterrimus;* black or piceous, elytra yellow transversely barred with from two to three irregular black bands, prothorax also sometimes yellow as well as antennæ and legs often rufous; length 11-14 mm. Southern Calif... ....*turbulentus* (Lec.)

Prosternum much as in *aterrimus;* abdomen very finely densely punctured; male black with occiput, pronotum except hind angles and median area, entire margin of elytra and often legs and antennæ reddish yellow, female entirely black; length 8-16 mm. Middle and southern states.....*limbalis* (Hbst.)

6. Antennæ with segments 2-3 small and about equal in size...... 9

Antennæ with second segment alone small, third almost as long as fourth and quite triangular.......................... 7

7. Head and elytra entirely coal black......................... 8

Black, front of head, prothorax except for large discal and sternal black spot, and basal margin of elytra yellowish red; first tarsal segment almost as long as following four united; simulates *rufilabris;* length 6 mm. Southern Pines, N. C...*tarsalis* Schfr.

8. Black, pubescence black, entire prothorax except sternum reddish yellow; pronotum and propleuræ finely, sparsely punctured; elytral striæ well impressed and distinctly, regularly punctured; intermediate segments of antennæ quite serrate; length 7-8 mm. Middle Sierra of Calif................*lepidus* Lec.

Similar to above in structure and coloration except that prothorax more sanguineous; the propleuræ rather coarsely, closely punctured, elytral striæ finely impressed and not distinctly punctured except at sides; length 6.5 mm. Ill.... ....*illinoiensis* n. sp.

9. Black, more or less ornamented with orange or red............ 10

Ferruginous or brownish, more or less unicolorous............. 14

10. Pronotum black or black with hind angles yellow............. 11

Pronotum, propleuræ and legs reddish orange; antennæ of males with erect hair; length 8-9 mm. Wash. to Calif....*nigriventris* Lec.

11. Elytra in great part black.................................. 12

Elytra in great part orange................................. 13

12. Pronotum coarsely, deeply punctured; black, the hind angles of prothorax always orange, males in addition with basal and sometimes transverse subapical elytral spots yellow (rarely a third between them), females with basal third of elytra yellow except for suture and small oblique subhumeral patch, and a small subapical spot; length 7-10 mm. Coastal area of northern Calif. (lives in rotting California laurel, *Umbellularia californica* Nutt.).....................*elegans* Horn

Pronotum finely, shallowly punctured; black, pronotum sometimes with small yellow area near hind angles, males in addition with basal and often subapical elytral spot yellow, females with yellow lunule (often broken) extending from base to near middle of elytra and a subapical spot; length 5-7 mm. Extends from Nova Scotia to B. C. and throughout Pacific States..............................*stigmosus* (Lec.)

13. Black, elytra with large orange spots, extending beyond middle, and subapical spots, outlining a black cross; length 5-6 mm. Calif..................................*quadrimaculatus* (Horn)

Black, elytra orange, scutellar spot and two transverse bands connected along the suture black; length 8 mm. Great Lake States and Canada (not Calif.).....................*rogersi* Horn

14. Narrow and elongate species, over four times as long as broad.. 15

Larger and more robust species, not four times as long as broad; ferruginous brown above, rufous beneath; antennæ in males extending slightly beyond hind angles; pronotum rather finely, closely and deeply punctured; length 9 mm. Southern N. M. and southern Ariz..........................*obtusus* n. sp.

15. Very narrow and elongate; antennæ in males reaching three segments beyond hind angles of prothorax; pronotal punctures not close together.................................... 16

Smaller and less elongate; antennæ in males extending about a segment and a half beyond hind angles of prothorax; pronotal punctures shallow, umbilicate and closely approximate; length 7.5 mm. Southern Ariz..............*variolatus* n. sp.

16. Reddish brown above, rufous beneath; head in males broader than apex of prothorax, eyes very large; pronotal punctures shallow and variolate; length 7.75-8 mm. Southern Ariz. ....*megalops* n. sp.

Ferruginous above, lighter beneath; head in males not broader than apex of prothorax; eyes normal; pronotal punctures more punctiform; length 8-9 mm. Southern Ariz..*longicornis* Schfr.

17. Smaller species, not over 8 mm. in length, second and third antennal segments small, outer carina poorly defined........ 18

Larger and more robust species, 10 mm. or over in length, both carinæ of hind angles of prothorax well defined........... 19

18. Black or piceous, base of prothorax and elytra and legs testaceous, beneath more or less rufous in front; pronotal punctures fine sparse; outer carina of hind angles of prothorax evident but vague; length 7-8 mm. Middle and southern states.*rufilabris* (Germ.)

Ferruginous, head somewhat piceous; pronotal punctures coarse and variolate; hind margin of posterior coxal plates emarginate near trochanter; length 8 mm. Brownsville, Tex.*nigriceps* Schfr.

19. Elongate, sub-cuneiform, brown; antennæ reaching hind angles of prothorax, second and third segments small, together shorter than fourth; prothorax longer than wide, pronotum deeply punctured; length 10 mm. Mo..............*angularis* Lec.

Elongate, brown, antennæ and legs rufous; antennæ in male reaching two segments beyond hind angles of prothorax, second segment small, third two-thirds length of fourth, together fully equal to fourth; prothorax longer than wide, disk coarsely, deeply and moderately closely punctured, hind angles with both carinæ sharply defined, the outer the longer; length 11 mm. Tex., southern Ariz........*insignis* (Lec.)

Megapenthes aterrimus (Motschulsky)

This common California species is generally of a uniform sooty black color. Recently, however, several male specimens have been taken near Riverton, Eldorado Co., Calif., which had a patch of white pile near the apices of each elytron.

Megapenthes illinoiensis Van Dyke, new species

Small, elongate, shining, coal black, pronotum except anterior and posterior margins and propleuræ bright red, sparsely clothed with short, semierect black pile. Head rather coarsely, umbilicately, and closely punctured; antennæ in male reaching at least one segment behind hind angles of prothorax, second segment small, third three-fourths as large as fourth and triangular, third to tenth distinctly serrate. Prothorax longer than broad, narrowed in front, sides slightly and evenly arcuate, hind angles acute, unicarinate, disk smooth, rather finely and sparsely punctured, more coarsely and closely near anterior angles. Elytra more than twice as long as broad, quite parallel anteriorly, gradually narrowed posteriorly, disk with striæ not deeply impressed and rather finely punctured near suture, more coarsely and distinctly at sides, intervals flat and more or less transversely rugose. Beneath with the prosternum distinctly but not closely punctured, the propleuræ rather closely and coarsely punctured, the meso and metasternum distinctly but not closely punctured, and the abdomen more finely punctured. Length 6.5 mm., breadth 2 mm.

Holotype: Male, No. 3116, Mus. Calif. Acad. Sci., a unique collected near **Urbana, Illinois,** April 28, 1928, by Mr. A. T. McClay and by him kindly presented to me.

This species is very close to the Californian *Megapenthes lepidus* Lec., but is somewhat smaller, with the prothorax sanguineous rather than orange, the front of the head more coarsely and closely punctured, the propleuræ also much more coarsely and closely punctured, and the elytra with the striæ finer and the strial punctures less clearly defined. It superficially resembles *Elater collaris* Say and might possibly be confused with that in eastern collections.

Megapenthes obtusus Van Dyke, new species

Male subelongate, robust; ferruginous brown, base of prothorax and elytra slightly yellowish, beneath more rufous, antennæ rufotestaceous and legs testaceous; surface clothed with coarse, yellowish brown pile. Head rather finely, not densely punctured; antennæ slender, reaching about one segment behind hind angles of prothorax, second segment small, third one-third longer, fourth the longest, longer than second and third combined, not quite twice as long as broad at apex, segments 4-10 serrate and gradually diminishing in length and breadth. Prothorax slightly longer at middle than broad; sides almost straight from apex of hind angles to anterior angles and gradually convergent, hind angles robust, rather long, slightly divergent, and unicarinate; disk convex, flattened above, feebly canaliculate basally, rather coarsely, deeply and closely punctured, finer apically, punctures obscure at base. Elytra more than twice as long as broad and twice as long as prothorax, sides almost straight and slightly converging posteriorly to posterior third, thence more rounded and convergent to blunt apex, disk rather deeply striate, striæ closely, moderately coarsely punctured, intervals subconvex, finely punctured and rugose, especially towards base. Beneath moderately, finely, sparsely punctured in front, more finely and closely on abdomen, posterior coxal plates but moderately dilated inwardly and with margin in front of trochanters slightly sinuate. Length 9 mm., breadth 2.75 mm.

The female is more robust, with sides of prothorax more parallel posteriorly, more rounded anteriorly, the elytra likewise with sides more arcuate and generally less cuneate, the antennæ also shorter.

Holotype: Male, No. 3117, Mus. Calif. Acad. Sci., from the **Chiricahua Mountains, Arizona,** July 9, 1908; *Allotype:* Female, No. 3118, Mus. Calif. Acad. Sci., from Cloudcroft, Sacramento Mountains, New Mexico, July 9, 1917, and one *Paratype* female, Texas Pass, Dragoon Mountains, Arizona, July 19, 1917, the last two collected and kindly presented by Prof. W. M. Wheeler.

Judging from the description of *Megapenthes angularis* Lec., this species somewhat resembles that in general features but it lacks the bicarinate hind angles to prothorax and the transverse posterior margin to the expanded inner portion of the posterior coxal plates. It suggests none of our other species.

Megapenthes variolatus Van Dyke, new species

Elongate, narrow, somewhat narrowed in front and distinctly so posteriorly; ferruginous, base of elytra somewhat yellowish, tarsi testaceous; clothed with rather coarse, yellowish pile. Head rather coarsely and moderately closely punctured, eyes not projecting beyond sides of prothorax, antennæ slender, extending at least a segment and a half beyond hind angles of prothorax, second and third segments small and of about equal length, fourth distinctly longer than the two combined, segments 4-10 slightly serrate and diminishing in breadth towards apex. Prothorax slightly longer than broad, sides straight, convergent forwards from apices of hind angles to anterior angles, hind angles prominent, slightly divergent and unicarinate, disk slightly convex, vaguely canaliculate posteriorly, densely, shallowly umbilicately punctured, obscurely so at base. Elytra slightly more than two and a half times as long as broad and two and a half times as long as prothorax (excluding hind angles), sides quite parallel in front, slightly arcuate and convergent to bluntly rounded apex, disk distinctly striate, the striæ finely, closely punctured, intervals flattened, finely punctured, and rugose, especially on basal area. Beneath rather finely and sparsely punctured in front, more closely so over ventral surface, posterior coxal plates distinctly broadened inwardly and with posterior margin in front of trochanters conspicuously emarginate. Length 7.5 mm., breadth 2 mm.

Holotype: Male, No. 3119, Mus. Calif. Acad. Sci., and several *Paratype* males from a series of eight specimens in my collection, taken at 6000-foot elevation on **Mt. Washington,** near **Nogales, Arizona,** July 16 and 17, 1919, by Mr. J. August Kusche.

This species in size and general shape somewhat resembles *rufilabris* and *nigriceps* but differs from the first in color, in having longer antennæ and hind prothoracic angles distinctly unicarinate; and from the latter in having the antennæ slightly longer and the hind prothoracic angles not bicarinate. From *longicornis* which it resembles in color, it differs by being shorter, more cuneate anteriorly and posteriorly, with shorter antennæ, and with the disk more coarsely and closely punctured.

Megapenthes megalops Van Dyke, new species

Male elongate, narrow, parallel; reddish brown, beneath rufous, antennæ and legs testaceous; sparsely clothed with rather coarse yellowish pile. Head shallowly, rather sparsely, umbilicately punctured, broader than prothorax at apex; the eyes large and prominent, almost hemispherical; antennæ long and slender, reaching at least three segments beyond hind angles of prothorax, second segment small, third slightly longer, fourth a third longer than second and third combined and twice as long as broad, segments 4-10 serrate and diminishing in breadth towards apex. Prothorax slightly longer than broad, sides slightly sinuate in front of hind angles, thence straight and barely converging, almost parallel, to anterior angles, hind angles prominent, slightly diverging and unicarinate; disk slightly convex, shallowly, umbilicately and not closely punctured as on head. Elytra over two and a half times as long as broad and nearly three times as long as prothorax (excluding hind angles), sides quite parallel for basal two-thirds, thence gradually rounded to apex; disk distinctly striate, striæ rather finely, closely punctured, intervals flattened, finely punctured and finely rugose. Beneath moderately finely and sparsely punctured in front, umbilicately on propleuræ, more minutely and closely on ventral surface, posterior coxal plates distinctly widened inwardly and with posterior margin in front of trochanters emarginate. Length 7.75 mm., breadth 2 mm.

The female differs by having the head not broader than anterior part of prothorax, the eyes less prominent, the antennæ shorter, just reaching beyond hind angles of prothorax, and the prothorax more robust, the sides a bit arcuate at middle and slightly rounded in front.

Holotype: Male, No. 3120; and *Allotype:* Female, No. 3121, Mus. Calif. Acad. Sci., and two *Paratypes* in my collection, the males from **Mt. Washington**, near **Nogales, Ariz.**, collected July 20, 1919, by Mr. J. August Kusche, and the female from Miller Cañon, Huachuca Mts., Ariz., July 14, collected by Mr. H. A. Wenzel and kindly presented to me by the late Mr. Henry Wenzel.

This species in size and general shape is most like *longicornis* and is perhaps closely related to it as indicated by its very long antennæ, but it differs by being darker in color, by having a broader head and larger eyes in the male, and a coarser type of punctation on pronotum.

BIBLIOGRAPHY

Megapenthes tartareus (Lec.) (Elater), Proc. Acad. Nat. Sci. Phila., 1859, p. 85; (Megapenthes), Lec., Tr. Am. Ent. Soc., XII, 1884, p. 6.

||*aterrimus* Schwarz (Trichophorus), Gen. Insect., fasc. 46, 1906, p. 259.

Megapenthes aterrimus (Mots.) (Dolopiosomus), Bul. Mosc., XXXII, II, 1859, p. 382; (Megapenthes), Horn, Tr. Am. Ent. Soc., III, 1871, p. 309; Lec., Tr. Am. Ent. Soc., XII, 1884, p. 6.

||*tartareus* Schwarz (Trichophorus), Gen. Insect., fasc. 46, 1906, p. 259.

horni Leng (Megapenthes), Cat. Col., 1920, p. 173.

Megapenthes turbulentus (Lec.) (Elater), Tr. Am. Phil. Soc., X, 1853, p. 463; (Megapenthes), Cand., Mon. Elat., II, 1859, p. 508; Lec., Tr. Am. Ent. Soc., XII, 1884, p. 6.

Megapenthes limbalis (Hbst.), male, (Elater), Käfer, IX, 1806, p. 53, t. 162, f. 10; Say, Tr. Am. Phil. Soc., VI, 1836, p. 167; Lec., Tr. Am. Phil. Soc., X, 1853, p. 463; (Ampedus), Germ., Zeits. f.d. Ent., V, 1844, p. 164; (Megapenthes), Gemm. & Har., Cat. Col., V, 1869, p. 1537; Lec., Tr. Am. Ent. Soc., XII, 1884, p. 6.

granulosus (Melsh.), female, (Ectinus), Proc. Acad. Nat. Sci. Phila., II, 1844, p. 159; (Megapenthes), Cand., Mon. Elat., II, 1859, p. 497; Lec., Tr. Am. Ent. Soc., XII, 1884, p. 6.

Megapenthes lepidus Lec., Tr. Am. Ent. Soc., XII, 1884, p. 7.

Megapenthes illinoiensis n. sp.

Megapenthes tarsalis Schfr., Jour. N. Y. Ent. Soc., XXIV, 1916, p. 259.

Megapenthes nigriventris Lec., Tr. Am. Ent. Soc., XII, 1884, p. 7.

Megapenthes elegans Horn, Tr. Am. Ent. Soc., III, 1871, p. 310, pl. iv, fig. 12; Lec., Tr. Am. Ent. Soc., XII, 1884, p. 7.

Megapenthes stigmosus (Lec.) (Elater), Tr. Am. Phil. Soc., (2) X, 1853, p. 472; (Megapenthes), Cand., Mon. Elat., II, 1859, p. 509; Lec., Tr. Am. Ent. Soc., XII, 1884, p. 7.

caprella (Lec.) (Elater), Rept. Exp. & Surv. Miss. to Pac., XII, p. 3; separate erroneously marked IX, 1860, p. 47; (Megapenthes), Cand., Mon. Elat., II, 1859, p. 510.

Megapenthes quadrimaculatus (Horn) (Limonius), Tr. Am. Ent. Soc., III, 1871, p. 313; (Megapenthes), Lec., Tr. Am. Ent. Soc., XII, 1884, p. 7; Horn, Henshaw List Col., 1885, p. 68; (Pheletes), Leng, Cat. Col., 1920, p. 168.

Megapenthes rogersi Horn, Tr. Am. Ent. Soc., III, 1871, p. 310, pl. IV, fig. 9; Lec., Tr. Am. Ent. Soc., XII, 1884, p. 7.

Megapenthes obtusus n. sp.

Megapenthes variolatus n. sp.

Megapenthes megalops n. sp.

Megapenthes longicornis Schfr., Jour. N. Y. Ent. Soc., XXIV, 1916, p. 258.

Megapenthes rufilabris (Germ.) (Elater), Ins. sp. nov. *etc.*, 1824, p. 47; Lec., Tr. Am. Phil. Soc., X, 1853, p. 472; (Ampedus), Germ., Zeits., f.d. Ent., V, 1844, p. 169; (Megapenthes), Cand., Mon. Elat., II, 1859, pp. 98-99; Lec., Tr. Am. Ent. Soc. XII, 1884, p. 6.

delicatulus (Dej.) (Oophorus), Cat., ed. 3, 1837, p. 105.

Megapenthes nigriceps Schfr., Jour. N. Y. Ent. Soc., XXIV, 1916, p. 259.

Megapenthes angularis Lec., Proc. Acad. Nat. Sci. Phila., 1866, p. 360; Lec., Tr. Am. Ent. Soc., XII, 1884, p. 7.

Megapenthes insignis (Lec.) (Elater), Tr. Am. Ent. Soc., XII, 1884, p. 11.

Genus **Anchastus** LeConte

SYNOPTIC TABLE

1. Smaller species, less than 7 mm. in length, hind angles of prothorax unicarinate, hind coxal plates suddenly dilated inwardly 2

Larger species, usually over 7 mm. in length 4

2. Broad and flattened, second and third antennal segments both much shorter than fourth; nigropiceous or black (elytra sometimes flavous), clothed with cinereous pubescence, fourth antennal segment longer than fifth and about as long as second and third together; length 4-6.5 mm. Calif. . . . . *cinereipennis* (Esch.)

Narrower and moderately convex, second antennal segment alone short, third and fourth about equal in length 3

3. Black with base of prothorax rufous, prothorax longer than broad; length 6 mm. Southeastern states . . . . *signaticollis* (Germ.)

Dark brown to castaneous, head and elytra sometimes piceous, prothorax not longer than broad; length 5-6 mm. Fla. . . *asper* Lec.

4. Upper surface uniformly black or piceous or ornamented with red or yellow markings, hind coxal plates gradually dilated inwardly 5

Upper surface more or less uniformly light brown, rufous or castaneous 8

5. Outer segments of antennæ broadly serrate, second segment small, third large and triangular and at least equal to fourth in length 6

Outer segments of antennæ cylindrical or but slightly serrate . . 7

6. Body somewhat shining, either entirely black or with basal area of elytra orange; length 8 mm. Calif............*militaris* Cand.

Body subopaque, black with antennæ, legs, and basal angles of prothorax rufous, also often with head, basal margin of prothorax and elytra, and propleuræ red; length 8 mm. Calif...*subopacus* n. sp.

7. Body black with elytra ornamented with two large humeral and two subapical yellow spots, antennæ and legs rufous, second antennal segment small, third three-fourths length of fourth and cylindrical; length 8 mm. Ind., Ga., Ala., Fla.....*binus* (Say)

8. Hind angles of prothorax unicarinate (a vague outer carina sometimes present), hind coxal plates gradually dilated inwardly 9

Hind angles of prothorax distinctly bicarinate, the outer carina parallel to the margin................................ 11

9. Much elongated and cylindrical, prothorax very closely and cribrately punctured, third antennal segment but little longer than second and much shorter than fourth, rufocastaneous throughout; length 9-11 mm...............*digitatus* Lec.

Less elongated and more flattened, third antennal segment one-half longer than second and but little shorter than fourth, bicolored... 10

10. Head, prothorax and underside rufous, elytra black, punctures of prothorax rather fine and well separated though numerous; length 6-7.5 mm. Ariz., southeastern Calif. and L. Calif. *bicolor* Lec.

Entire upper surface dark brown, beneath rufous, punctures of prothorax coarse, umbilicate and approximate; length 8 mm. ....*ventralis* n. sp.

11. Third segment of antennæ as long or longer than the fourth, posterior coxal plates gradually dilated inwardly.......... 12

Third segment of antennæ distinctly shorter than fourth....... 13

12. Prothorax longer than broad, third segment of antennæ triangular and distinctly longer than fourth, second very small; length 8 mm. Ariz..................................*arizonicus* n. sp.

Prothorax broader than long, third segment of antennæ equal to fourth; length 10 mm. New Orleans, La............*rufus* Cand.

13. Prothorax longer than broad, third segment of antennæ longer than second and with second about equal to fourth, hind coxal plates suddenly dilated inwardly; length 8-9 mm. Fla., Ga....................................*bicarinatus* Lec.

Prothorax nearly square, third segment of antennæ longer than second, second and third together hardly equal to fourth, hind coxal plates gradually dilated inwardly; length 10.5 mm. Ariz., southeastern Calif.........................*sericans* Cand.

Anchastus subopacus Van Dyke, new species

Broad and depressed, subopaque, black, the head, entire margin of prothorax including the posterior angles, the propleuræ, first two segments of antennæ and legs a bright red; upper surface moderately densely clothed with a fine, short grayish black pile, suberect on the head and prothorax, more depressed on the elytra, the under surface more sparsely clothed. Head coarsely and closely punctured, middle portion of clypeal margin slightly lobed; antennæ reaching beyond the hind angles of the prothorax, the second segment small and transverse, the third longer than the fourth and but slightly longer than broad, segments 3-10 very much serrated, the eleventh elliptical and constricted before apex. Prothorax as broad as long, sides gradually arcuate from base to apex, basal angles prominent, acute, projecting backwards and unicarinate, the carinæ extending forwards to base of angles and diverging from sides; disk moderately convex, coarsely and closely punctured, canaliculate only in front of scutellum. Elytra over three times length of prothorax and twice as long as broad, sides almost parallel in basal portion, thence gradually arcuate to apex; disk moderately convex, finely punctato-striate, the punctures more evident anteriorly, the intervals flat, finely punctured and granulate. Beneath the prosternum finely, sparsely punctate, the propleuræ, meso- and metasternum coarsely, closely punctate, and the abdomen more finely and somewhat strigosely punctate, the hind coxal plates gradually but rather strongly dilated inwardly. Length 8 mm., breadth 3 mm.

Holotype: No. 3122, Mus. Calif. Acad. Sci., from **Havilah, Calif.**, collected June 13, 1913, and three paratypes in my collection, one from Clear Lake, Lake Co., Calif., collected May, 1895, which agrees with the holotype except in being a bit smaller and in having only the anterior margin of the head and the basal portion of the prothorax red, lacking the red sides and propleuræ, though having the basal margin of the elytra distinctly reddened. The other paratyes from Sequoia National Park, Calif., May 28, 1929, approach the type very closely in size and coloration. I have also seen two other specimens, one collected near Kaweah, Calif., by Mr. Ralph Hopping and now in his collection, and one in the collection of Dr. George Horn, now in the Philadelphia Academy.

This species because of its general appearance and type of antennæ should be placed near to *militaris* Cand. It differs from that by being broader and more generally robust, subopaque and by having a different color pattern.

Anchastus militaris Candèze

The typical bicolored phase of this species is rather rare. I have seen only a few specimens of these, one in the collection of Dr. George Horn, three in my own collection and two or three elsewhere. My specimens were collected: one near Lake Tahoe, one at Meadow Valley, Plumas Co., Calif., June 6, 1924, and one in the Sequoia National Park, June 5, 1929.

An all-black phase is, however, less rare and is widely distributed throughout the Sierra Nevada mountains and northern California generally. This phase, I am calling the subspecies **corvus** and designating two specimens from **Eldridge, Sonoma Co., Calif.**, one as the holotype (No. 3123, Mus. Calif. Acad. Sci.), the other as a paratype. Other specimens in my series of thirteen specimens are from Humboldt Co., Shasta Co., Placer Co., and Forest Home, San Bernardino Co., Calif., June 18, 1928. It does not differ structurally at all from the typical form.

Anchastus ventralis Van Dyke, new species

Elongate, slightly depressed, shining, brown, the antennæ, posterior margin of pronotum, including the angles and entire underside, rufous, darker in front, surface moderately clothed with a short yellowish pubescence. Head coarsely and closely punctured, the clypeal margin entire and slightly lobed at the middle; antennæ reaching one segment beyond the hind angles of prothorax, the second segment small, but slightly longer than broad, the third almost twice the length of second and but little shorter than fourth, segments 3-10 but slightly serrated. Prothorax as broad as long, sides straight near base and slightly arcuate and convergent forwards, hind angles prominent, acute, projecting backwards and unicarinate, the carinæ acute and extending forward almost to middle of prothorax and close to and almost parallel to side margin; disk convex, coarsely umbilicately and densely punctured, canaliculate posteriorly at middle, a fine longitudinal carina evident in the depression. Elytra almost three times as long as prothorax and a little over twice as long as broad, sides almost straight and parallel to apical third, thence arcuate to apex; disk moderately convex, punctato-striate, the punctures rather large and crenulate, the intervals slightly convex, finely punctate and perceptibly scabrous. Beneath moderately coarsely, closely punctured anteriorly, more finely on abdomen; coxal plates moderately wider inwardly, very narrow outwardly. Length 8 mm., breadth 2.5 mm.

Holotype: No. 3124, Mus. Calif. Acad. Sci., a unique in my collection, collected on **Mt. Washington** near **Nogales, Ariz.,** alt. 6000 ft., July 13, 1919, by Mr. J. August Kusche. A second specimen, a male, collected on Kits Peak, Rincon, Baboquivari Mts., Ariz., Aug. 4, 1916, by Dr. Lutz, is in the collection of the American Museum of Natural History. This, I have designated as a paratype. It differs from my specimen only by being a bit lighter in color and by having the punctures less umbilicate at the center of the pronotum.

This species is no doubt closely related to *Anchastus bicolor* Lec. but it differs by being of a uniform dark brown color above with a golden yellow pile, not with head and prothorax a bright red and elytra black and with black pile; by being slightly longer and more definitely attenuated both before and behind, less parallel; and by having the prothoracic punctures coarse, umbilicate and approximate, not sharply impressed and well spaced. It is possible that it is the same as *Anchastus desertus* Horn, the type of the latter being a poorly pigmented or immature specimen. If so, the latter is most certainly not a synonym of *bicolor* as generally placed, but a good species.

Anchastus arizonicus Van Dyke, new species

Elongate, narrowed anteriorly and posteriorly, rufous, antennæ and legs paler, moderately shining, clothed with short yellowish hairs giving the surface a silken appearance. Head coarsely, moderately closely punctured; antennæ reaching beyond hind angles of prothorax, second segment small and transverse, third long, nearly twice as long as broad and about one-fourth longer than fourth, segments 4-7 of about equal length and breadth, 8-10 somewhat narrower, 3-10 serrate, eleventh about as long as third, elliptical and slightly constricted near apex. Prothorax longer than broad, sides feebly arcuate and gradually narrowed from base to apex, hind angles acute, prolonged backwards, bicarinate, the inner carina very sharp, the outer finer, longer and close to lateral margin; disk moderately convex, coarsely, rather closely punctured at middle, more coarsely, shallowly, umbilicately, and approximately at sides. Elytra barely narrower than the prothorax at the humeri, gradually narrowed from base to apex, moderately convex, disk striate, the striæ coarsely punctured basally, much finer apically, intervals flat, rather coarsely, closely punctured and somewhat scabrous anteriorly, much more finely and sparsely punctured posteriorly. Beneath moderately coarsely and closely punctured in front, abdomen more finely; the hind coxal plates strongly and suddenly dilated internally. Length 7 mm., breadth 2.25 mm.

Holotype: Male, No. 3125, Mus. Calif. Acad. Sci.; and *Paratype:* Male, in my collection; the first collected at **Texas Pass, Dragoon Mts.**, Ariz., July 21, 1917, by Prof. W. M. Wheeler, the second taken at Coyote Mts., Ariz., Aug. 4-7, 1918, by Dr. Frank E. Lutz, and both specimens kindly presented by the collectors. Three other specimens collected by Dr. Lutz at Kits Peak, Rincon, Boboquivara Mts., Ariz., Aug. 1-4, 1916, and kindly submitted for study by the American Museum of Natural History, have also been designated as paratypes.

This species because of the bicarinate hind angles of the prothorax might be confused with *bicarinatus* and *sericans,* but it differs from both by having the third antennal segment distinctly longer than the fourth. In addition, the finer and closer pronotal punctation of *bicarinatus* and the larger size and greater robustness of *sericans* will readily assist in their separation. It is perhaps even closer to *rufus* but that is stated to be larger, to have a broader prothorax and third antennal segment equal to fourth. It cannot be confused with any species described by Champion from Mexico, in the Biologia.

BIBLIOGRAPHY

Anchastus cinereipennis (Esch.) (Monocrepidius), Thon., Ent. Arch., II, 1829, p. 31; Dej., Cat., 3rd ed., 1837, p. 98; (Cryptohypnus), Mann., Bul. Mosc., XVI, 1843, p. 240; (Anchastus), Cand., Mon. Elat., II, 1859, p. 406.
  tantillus (Mann.) (Cardiophorus), Bul. Mosc., XVI, 1843, p. 239; (Aplastus), Cand., Mon. Elat., II, 1859, p. 407.
  puberulus (Mann.) (Cryptohypnus), Bul. Mosc., XVI, 1843, p. 240.
  recedens (Lec.), Tr. Am. Phil. Soc., n. s. X, 1853, p. 460.
  hirsutulus (Mots.) (Monocrepidius), Bul. Mosc. XXXII, 1859, p. 364.
  regularis (Mots.) (Monocrepidius), Bul. Mosc., XXXII, 1859, p. 364.
  piliferus (Mots.) (Monocrepidius), Bul. Mosc. XXXII, 1859, p. 365.

Anchastus signaticollis (Germ.) (Ampedus), Zeits. f.d. Ent., V, 1843, p. 190; (Anchastus), Cand., Mon. Elat., II, 1859, p. 403.

Anchastus asper Lec., Proc. Am. Phil. Soc., XVII, 1878, p. 404.

Anchastus militaris Cand., Mem. Soc. Sci. Liege, 2d Ser., IX, 1881, p. 59; Horn, Tr. Am. Ent. Soc., XII, 1885, p. 49.

Anchastus militaris corvus n. subsp.

Anchastus subopacus n. sp.

Anchastus binus (Say) (Elater), Tr. Am. Phil. Soc., VI, 1839, p. 178; (Discrepidius?), Lec., Tr. Am. Phil. Soc., X, 1853, p. 461; Henshaw, List Col., 1885, p. 67.

Anchastus digitatus Lec., Tr. Am. Phil. Soc., X, 1853, p. 459.
  longulus Lec., Proc. Am. Phil. Soc., XVII, 1878, p. 404.

Anchastus bicolor Lec., Proc. Acad. Nat. Sci. Phila., 1866, p. 390; Tr. Am. Ent. Soc., XII, 1885, p. 50.
  desertus Horn, Tr. Am. Ent. Soc., III, 1871, p. 311.

Anchastus ventralis n. sp.

Anchastus arizonicus n. sp.

Anchastus rufus Cand., Mon. Elat., II, 1859, p. 404.

Anchastus bicarinatus (Lec.) (Brachycrepis), Tr. Am. Phil. Soc., X, 1853, p. 461; (Anchastus), Cand. Mon. Elat., II, 1859, p. 405.

Anchastus sericans Cand., Mem. Soc. Sci. Liege, 1891, p. 106.
  sericeus Horn, Tr. Am. Ent. Soc., III, 1871, p. 311.
  horni Schw., Gen. Insect., fasc. 46, 1907, p. 315.

Anchastus frontalis Horn, Tr. Am. Ent. Soc., XII, 1885, p. 49.
  =*Physorrhinus fusculus* Champ., Biol. Cent. Am., Col., III, pt. 1, p. 385.

Anchastus fuscus Lec., Proc. Am. Phil. Soc., XVII, 1878, p. 404.
  =*Ischiodontus fuscus* (Lec.), Tr. Am. Ent. Soc., IX, 1882, p. 238.

Hypnoidini

In his revision of our species, Horn[8] used *Cryptohypnus* Germ. as the genus to include the bulk of our species. Later he[9] accepted *Hypnoidus* Steph. for those species which had the middle coxal cavities closed outwardly only by the meso- and metasternites. The present belief is that all of the species listed under these two genera as is done in the Leng Catalogue, belong to a single genus as Horn treated them but that the genus *Hypnoidus* Steph., being the older name, should be used instead of *Cryptohypnus* Germ. This procedure is followed by Schenkling,[10] the latest to catalogue them. *Cryptohypnus* may be used as a subgenus of *Hypnoidus,* to include those generally larger species which have the middle coxal cavities closed outwardly by the meso-epimeron as well as the meso- and metasternites. Inasmuch as I am establishing a new genus in the tribe, I thought that it might be well to make out a key for the North American genera of that tribe.

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[8] A monograph of the species of Cryptohypnus of Boreal America, by George H. Horn, Tr. Am. Ent. Soc., XVIII, 1891, pp. 1-31.

[9] A note on Cryptohypnus, by George H. Horn, Ent. News, V, 1894, pp. 6-7.

[10] Schenkling, Junk's Col. Cat., Pars 80, Elateridæ I, pp. 200-215.

Key to Genera

1. Tarsal claws simple, tarsi clothed beneath with stiff hair......... 2
   Tarsal claws toothed, tarsi clothed beneath with silken pile...... 3
2. Front completely margined, last maxillary palpal segment simply dilated.................................... *Hypnoidus* Steph.
   Front with margin interrupted at middle, last maxillary palpal segment cultriform........................ *Anthracopteryx* Horn
3. Last maxillary palpal segment cultriform[11]......*Paroedostethus* n. genus
   Last maxillary palpal segment dilated................*Oedostethus* Lec.

Hypnoidus glacialis Van Dyke, new species

Elongate, broad, and flattened; shining black above, rufopiceous beneath, the antennæ and legs bright red; upper surface clothed with short, suberect black pile, lower surface with very fine, closely appressed gray pile. Head longitudinally impressed at middle, finely, sparsely punctured; antennæ long, about reaching hind angles of prothorax, all segments considerably longer than broad, the second twice as long as broad and about two-thirds the length of third, the latter one-fourth longer than fourth, the following gradually shorter and slightly broader. Prothorax large, about as broad as long at middle, sides markedly arcuate, narrowed and sinuate in front of hind angles, the latter narrowed, elongate, divergent, and with a fine carina extending forwards and near the margin, one-third the length of the prothorax; disk slightly convex, finely sparsely punctured and with well impressed median canaliculation near base. Elytra over twice as long as prothorax and twice as long as broad, the sides arcuate from humeri to near base and gradually rounded at apex, disk slightly convex, striæ sharply impressed and finely punctured, intervals convex and very finely punctured. Beneath very finely, sparsely punctured. Length 8.5 mm., breadth 3 mm.

Holotype: No. 3126, Mus. Calif. Acad. Sci., and eight *Paratypes* in my collection, the first from Lake MacDonald, **Glacier National Park, Montana,** July 7, 1930, the others from near Eureka, Montana, July 9, 1930. Besides these, I also collected one in the Yellowstone National Park and have studied specimens from Garibaldi, B. C., July 24-31, 1926, collected by Mr. G. A. Hardy and from Waterton Lake, Alberta, Canada, July 10, 1930, collected by Mr. F. S. Carr.

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[11] The segment is not quite so long as it is in *Anthracopteryx* Horn, see Plate I, fig. 7, Tr. Am. Ent. Soc., XVIII, 1891.

This species is very closely related to *grandicollis* (Lec.) and looks very much like it. It differs by having the pronotum very finely and sparsely punctured instead of coarsely, closely punctured, the head sulcate, the hind angles of prothorax narrow, not more or less triangular, and the elytra with well impressed striæ and convex intervals, in contrast with the five striæ and flat intervals of *grandicollis*.

Hypnoidus sanborni (Horn)

Hypnoidus barbatus (Sahlb.) and *sanborni*, I consider one and the same. I have series of both and cannot separate them except by the labels.

Hypnoidus lecontei hirsutus Van Dyke, new subspecies

This subspecies resembles the more typical form of *lecontei* which extends clear across the continent from the northern New England States to British Columbia and throughout the mountains of Washington and Oregon, except that it is more convex and decidedly hairy, the pile over the entire upper surface being from two to three times as long as it is in the typical from and much finer in texture. So pronounced is this feature that even when examined superficially, one's attention is immediately attracted to it.

Holotype: Male, No. 3127; and *Allotype:* Female, No. 3128, Mus. Calif. Acad. Sci., and several designated *Paratypes* in the collection of the California Academy of Sciences, from a series of about a dozen specimens collected on **Mt. Timpanogos, Wasatch Mts., Utah,** July 9, 1922, by Mr. E. P. Van Duzee. I have also four specimens which I collected in the same region, June 6, 1926.

Genus **Paroedostethus** Van Dyke, new genus

Robust, simulating in general appearance the members of the *hyperboreus* group of *Hypnoidus*. Head with front slightly convex above, flattened anteriorly, frontal margin complete and elevated; antennæ reaching beyond posterior angles of prothorax, segment two, twice as long as broad, three, one and a half times as long as two, segments 3-10 feebly serrate, gradually shorter and broader towards apex, eleventh as long as fourth and acute at apex; maxillary palpi moderately long, the last segment broadly cultriform, longer than the preceding two segments together. Thorax without defined basal incisures and with margin acute and straight when viewed laterally. Scutellum subquadrate, the posterior margin slightly arcuate. Elytra elliptical, humeri broadly rounded, wings well developed. Prosternum broad, lobe well developed but not concealing the mouth anteriorly, the sutures slightly arcuate outwardly and somewhat convergent posteriorly, tip of prosternum acute, flexed upward toward the body. Middle coxal cavity closed outwardly by the mesosternum, the mesoepimeron (broadly), and metasternum. Posterior coxal plates suddenly but obliquely and not very greatly dilated at inner third, the internal lamina with an acute tooth at the inner side of the trochanter. Tarsi as long as the tibiæ, the first segments gradually decreasing in length and not lobed but densely clothed beneath with short silken pile, the claws with a broad obtuse tooth near the middle.

Genotype *Paroedostethus relictus* n. sp.

This genus undoubtedly belongs in the tribe Hypnoidini because of its suddenly dilated posterior coxal plates, broad prosternum with single lateral sutures, convex outwardly, and the filiform tarsi. Its relationship to the other American genera contained within the tribe can best be seen by referring to the table.

Paroedostethus relictus Van Dyke, new species

Oblong, convex, robust, flavocastaneous, head and prothorax moderately shining, elytra subopaque, sparsely clothed with short, inconspicuous yellow pubescence, longer and more evident on abdomen. Head distinctly, regularly, not closely punctured; eyes moderately large; antennæ reaching beyond hind angles of prothorax. Prothorax slightly broader than long, broadest at middle, sides evenly arcuate from anterior angles to near posterior angles where distinctly sinuate; hind angles acute, divergent, and carinate; disk convex, median longitudinal impression complete but vague, moderately closely and regularly punctured. Elytra elliptical, broadest behind the middle, sides straight from humeral angle to point of greatest width then evenly arcuate to apex; disk finely striate and punctate, less defined apically; intervals flat, finely and rather regularly punctured and slightly rugose. Beneath rather coarsely and moderately closely punctured on prothorax, more finely and closely over abdomen. Length 8.5 mm., breadth 3 mm.

Holotype: No. 3129, Mus. Calif. Acad. Sci., a unique in my collection, collected in Cold Water Cañon, slopes of **Mt. San Antonio** (Old Baldy), **Los Angeles Co., Calif.**, Sept. 10, 1906, by Mr. J. August Kusche.

Genus **Horistonotus** Candeze

This genus which is related to *Cardiophorus* by having a cordiform scutellum, though differing from the same by having the prothorax laterally margined in the basal half, is represented in the material before me by two very distinct new species. Horn's revision[12] is so comparatively recent that the synopsis and bibliography of the genus can be omitted for the species can readily be placed by referring to Horn's key.

Horistonotus umbilicatus Van Dyke, new species

Elongate, moderately slender, convex, rufopiceous, the prothorax and sides beneath generally rufous, the antennæ and legs testaceous, and sparsely clothed with somewhat coarse fulvous pile. Head slightly convex, finely punctured with coarser punctures here and there, the clypeus projecting, the anterior margin subangulate at middle; the antennæ slender, extending about one segment beyond apex of hind angles of prothorax in male, about reaching base of hind angles in female. Prothorax as long as broad in male, slightly broader in female, distinctly broader at base than apex, the base biemarginate, without notch but with fine plicæ, the sides moderately arcuate, the hind angles not divergent, the disk finely punctured and with series of large, shallow, umbilicate impressions rather regularly dispersed over the surface. Elytra not wider than prothorax, slightly more than twice as long as wide, the sides slightly arcuate and gradually narrowed towards apex, disk with striæ deeply impressed and rather coarsely punctured, the intervals convex, somewhat costiform near apex, very finely punctured. Beneath finely punctured with large and shallow punctures irregularly disposed over surface anteriorly. Tarsal claws dentate from beyond middle to base. Length 6 mm., breadth 2 mm.

Holotype: Male, No. 3130; and *Allotype:* Female, No. 3131, Mus. Calif. Acad. Sci., and two *Paratypes* in the collection of the California Academy of Sciences, the first two from **Patagonia, Ariz.**, Aug. 1, 1924, collected by Mr. J. O. Martin; the paratypes, both males, from Badger, Ariz., July 31, 1924, and St. Xavier Mission, Ariz., July 30, 1924, collected by Mr. E. P. Van Duzee. A fifth specimen belonging to the American Museum of Natural History and collected at Tucson, Arizona, July 21-23, 1916, has also been designated as a paratype.

This species superficially resembles *Horistonotus exoletus* Er. but differs by having toothed, not cleft tarsal claws, subangulate clypeus, and a series of large umbilicate impressions over the pronotum. In Horn's group B, to which it belongs because of the toothed tarsal claws, it would run to the series containing *simplex, curiatus* and *gracilis,* to which species it shows no resemblance whatever though it is about the size and shape of the last. The only Mexican species which it approaches is *H. obliteratus* Champ., from which it differs by being quite convex, with distinctly convex elytral intervals and by having the large *"punctures"* of the pronotum equally dispersed, not mainly confined to the frontal area.

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[12] Trans. Am. Ent. Soc., XII, 1884, pp. 33-41.

Horistonotus lutzi Van Dyke, new species

Small, rather broad, but slightly convex and testaceous or rufotestaceous throughout. Head somewhat flattened, finely, sparsely punctured; the clypeal margin arcuate; the antennæ rather robust, extending about two segments beyond hind angles of prothorax. Prothorax broader than long, broader at base than apex, the base biemarginate, without notch or plicæ, the sides almost straight and parallel in basal half, gradually rounded at apex, the disk very finely, quite obscurely punctured, and with larger punctures intermixed. Elytra about twice as long as broad, the sides very slightly arcuate, gradually rounded towards apex, the disk with striæ finely impressed and rather coarsely punctured towards base but finer towards apex, the intervals more or less flattened and very finely punctured. Beneath very finely, obscurely punctured, the prosternum and propleuræ with quite coarse punctures intermixed, the abdomen with a series of punctures somewhat larger than the fine ones intermixed with them. Tarsal claws dentate from beyond the middle to base. Length 4 mm., breadth 1.5 mm.

Holotype and two *Paratypes* in the collection of the American Museum of Natural History, the first collected on Kits Peak, Rincon, **Baboquivari Mts., Ariz.,** Aug. 1-4, 1916, the others from Sta. Cruz Village, Cobabi Mts., Ariz., Aug. 10-12, 1916, and Tucson, Ariz., Aug. 21-23, 1916. I have retained for my collection two other paratypes, one collected at Palo Alto, Ariz., July 29-30, 1916, and Santa Cruz Village, Cobabi Mts., Ariz., Aug. 10-12, 1916. I am naming this after Dr. F. E. Lutz, the presumed collector of the specimens, who has so kindly placed this material at my disposal for study.

This small testaceous species would run in Horn's key to the series containing *simplex, curiatus,* and *gracilis.* Its color and size, for it is smaller and less convex than *curiatus* the smallest of the three species mentioned above, will readily separate it. No described Mexican species seems to resemble it either. Superficially it very much resembles *Esthesopus pusio* Horn but the latter is not only more convex but differs generically.

Genus **Melanotus** Eschscholtz

This genus is very poorly represented in California. Though there are several species which are to be found within its confines, there is but one which is more or less characteristic of it and that is *Melanotus longulus*[13] (Lec.). This species is, however, very variable, with the result that several of the phases have been described as distinct. Field studies carried on over a period of many years as well as a careful study of a large series of specimens has convinced me that *longulus, variolatus* and *oregonensis* are but variations of one thing. *Cratonychus longulus* Lec. was described in 1853 on page 473, of the same work in which *oregonensis* Lec. was described on page 480. The first was based upon rather small, elongate specimens from San Diego, Calif. My specimens from this type locality average 10 mm. in length. In 1861, *Melanotus variolatus* Lec., was described from specimens taken at San Pedro, Los Angeles Co., Calif., a point on the coast not so very far north of San Diego. This form is rather common throughout Los Angeles County and it extends north along the coast as far as Carmel, Monterey County, and inland at least as far as Fort Tejon, Kern County. It averages about the same length as *longulus* but is in general slightly more robust and a bit blacker though many specimens cannot be separated from typical *longulus*. The characters given by LeConte for the separation of *variolatus* are not specific but individual. I also have a number of small specimens from Exeter, Utah, collected by Mr. Tom Spalding, which cannot be distinguished. Throughout the San Francisco

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[13] This *longulus* should not be confused with the *longulus* of page 480 of the same publication in which it is described, Tr. Amer. Phil. Soc. (2), X, 1853, p. 473.

Bay region and much of middle California, these small forms are replaced by a race which is in general large and robust, 13–15 mm. in length, of a very black color, with antennæ and legs rufous as is the case with the others. As much as this large and typical lowland race or subspecies is without a distinguishing name I will call it **franciscanus** and designate a holotype (No. 3132, Mus. Calif. Acad. Sci.) and paratypes from **Alameda County, Calif.** In the Sierra Nevada Mountains as well as north through Oregon into British Columbia and eastward as far as the Wasatch Mountains of Utah, this race is replaced by the equally long but narrower *oregonensis*. This northern race is also generally lighter in color, brown instead of black, and sometimes with dark legs though contrary to what LeConte states, the legs of *oregonensis* are generally rufous as they are in the other races. His material was too limited. The small, narrow, dark brown *longulus* of San Diego gradually becomes larger and passes into *oregonensis* as it ranges eastward into the Great Basin and northward through the Sierra Nevada Mountains, and darker and broader as it ranges north through Los Angeles County and becomes still larger and more robust by the time it reaches the lowlands of middle California. This last is the race or subspecies *franciscanus*. These are all subspecies or races of one species and they grade gradually into each other, though in certain definite areas the majority of specimens are generally of a pure racial strain.

Genus **Limonius** Eschscholtz

This genus is generally defined by having the clypeus distinctly and completely margined in front and elevated above the labrum, the mouth anterior, the prosternal sutures nearly straight, double and but shallowly or deeply excavated in front, the hind coxal plates narrowed outwardly and but gradually dilated inwards, the tarsi subcylindrical with the first segment the longest and the following gradually shorter and without lobes beneath, and the tarsal claws simple. As such it falls in the tribe *Lepturoidini* as previously constituted, but with *Lepturoides* Herbst. and its close allies removed as should be done because of their short prosternal lobe, it would then have to be placed in the tribe *Athoini*. Of the various characters given, the most useful for separating the species from those of related genera are the double prosternal sutures and the type of tarsi, the presence of the very long first and short fourth segment in

Athous readily separating the members of this genus from *Limonius.* The clypeus is quite variable, often deeply impressed at base as in typical *Athous* and sometimes with the anterior margin much depressed and even slightly interrupted at its middle, approaching in this regard *Ludius* (*Corymbites*).

The genus *Nothodes* Lec. was founded upon a species with the clypeal margin interrupted, but as much as this character has been found to be variable in general and variable even within specific limits as has been shown in the type species, *dubitans* (Lec.), by a series of specimens received from Charles Dury. In this series, which was all from one locality, some of the specimens had the clypeal margin depressed and interrupted at middle, others had the clypeus complete. These latter were all typical *Limonius* and very close in all regards to the members of the group containing *canus* Lec. and *agonus* Say. For this reason I have suppressed the genus *Nothodes* and placed its lone species, *dubitans,* in *Limonius.* The prosternal sutures are also very variable. In typical *Limonius* Esch., they are more or less excavated in front, the excavation in some extending posteriorly for quite a distance while in others they are but feebly if at all excavated in front. These latter have been placed by some in the genus *Pheletes* Kies. I have preferred, however, to place this as but a subgenus of *Limonius,* for the character upon which it is founded is not only variable but unsupported by any other, the species being in the main like typical *Limonius.* It is parallel to what exists in *Hypnoidus* Steph. and *Cryptohypnus* Esch. The former resembles *Limonius,* having the open sutures, and the latter *Pheletes* with the closed sutures, yet the latest European authorities place them together as one genus. The genus *Gambrinus* Lec. was established for *armus* Say, a synonym of *stigma* Hbst., and was suppressed by Lacordaire[14] as he could find no generic characters to distinguish it.

The genus *Limonius* is a moderately large one, holarctic in distribution with one exception, and with a large proportion of the species confined to North America and especially evident on the Pacific Slope. The last revision of our species was by

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[14] Gen. Col., IV, 1851, p. 183.

LeConte[15] and his data were incorporated in the great work of Candeze.[16] Since this time quite a number of new species have been added. I am adding eight more and one subspecies, and at the same time trying to place the others in their proper relationships with each other. I have specimens of all of the known species from our fauna, most species represented by large series, and in addition possess a fair knowledge of the habits of the majority. In this latter regard, Mr. L. C. Lane of Walla Walla, Wash., has greatly assisted me by supplying me with some of his field notes and allowing me to study most of his specimens, thus fortifying my opinion with regard to the status of several of the variable species such as *californicus* and *occidentalis, canus* and *discoidens. Limonius (Pheletes) quadrimaculatus* Horn was correctly removed by Horn and placed in *Megapenthes. Limonius cribricollis* Horn was found to be a synonym of *Melanotus longulus* (Lec.). *Limonius (Pheletes) ornatipennis* Lec., I consider an *Athous*, chiefly because of its single prosternal sutures and type of tarsi, so am placing it in that genus. The status of others will be discussed later on or shown in the synoptic table or bibliography, the synonymical portion of the latter showing their relationships best.

SYNOPTIC TABLE

1.	Prosternal sutures distinctly grooved in front, *Limonius* s. str..	2
	Prosternal sutures not distinctly grooved in front, subgenus *Pheletes* Kies	34
2.	Species with elytra bicolored or rufous	3
	Species with elytra black, brown or piceous	14
3.	Clypeal margin semicircularly incised at middle, dentiform at sides of incision	13
	Clypeal margin simply emarginate at most at middle	4
4.	Pronotum deep blue, bronzed or metallic	5
	Pronotum black or piceous, not metallic	10
5.	Prothorax as broad or almost as broad as long	6
	Prothorax distinctly longer than broad	7

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[15] Revision of the Elateridæ of the United States, by John L. LeConte, Tr. Am. Phil. Soc., X, 1853, pp. 424-426, 428-435.

[16] Monographie des Élatérides, par M. E. Candeze, Liege, III, 1860, pp. 377-413.

6. Elytra varying from yellow or orange with black sutural stripe and cordiform patch covering apical half, to all yellow or orange except small black sutural marking near apex; prothorax in general with sides quite parallel basally and evenly rounded to apex, disk slightly bronzed, elytral striæ rather deeply impressed in front with circular punctures; length 9-11 mm., northern Calif.............................*mirus* Lec.

Elytra vermilion or orange red with the suture towards apex and the apex black, prothorax gradually arcuately convergent from base forwards, pronotum a deep bluish black, elytra with striæ more finely impressed and with smaller and more elongate punctures; length 9-11 mm. Northern Calif....*ulkei* Horn

7. Greater portion of elytra orange.......................... 9

Greater portion of elytra black........................... 8

8. Elytra with humeral area alone orange, pronotum coarsely, cribrately punctured; length 9.5-12 mm. Pacific States, Utah, B. C., and Alberta...........................*crotchi* Horn

Elytra with apical half and one large maculation on each elytron near base, black, the latter sometimes united transversely or posteriorly with the apical area, pronotum less coarsely punctured; length 7-10 mm. Mountains of northern Calif. and Cascades of Ore. and Wash......................*pictus* n. sp.

9. Each elytron with two black maculations, one in front and one behind middle, quite vague in more southern specimens, pronotum moderately finely and closely punctured, species more elongate than usual; length 10-15 mm. Northern Great Basin from eastern B. C. south to Siskiyou Co., Calif. ....*venablesi* Wick.

10. Elytra unicolorous red.................................. 11

Elytra more or less bicolored............................ 12

11. Entire elytra as well as hind angles of prothorax and a portion of feet rufous, pronotum black and finely not closely punctured except at sides; second and third antennal segments small and equal, together hardly as long as fourth; length 8-9 mm. Mountains of northern Calif. and north to B. C. ....*bicolor* n. sp.

12. Basal portion of elytra rufotestaceous, as well as antennæ, legs and much of under surface; the apical portion of elytra more or less piceous, the darker area not sharply differentiated from basal portion; pronotum moderately finely, closely punctured; second and third antennal segments each but little shorter than fourth; length 10 mm. B. C., northern Calif. and northern Ariz.........................*nebulosus* n. sp.

Black or rufo-piceous, basal margin or basal patch on elytra, the latter often faintly extended posteriorly as a broad vitta, epipleuræ and legs testaceous (base of prothorax and basal angles in the male, also often testaceous), head and pronotum finely or moderately finely and not closely punctured; second and third antennal segments longer than broad, about equal in length or third slightly longer, and together distinctly longer than fourth; length, female 9.5 mm., male 7 mm. Mountains of middle and northern Calif. . . . *huguenini* n. sp.

13. Second and third antennal segments small, of about equal length, together about as long as fourth; body black with hind angles of prothorax, entire elytra or merely margins, all or most of legs, and sometimes antennæ, rufous; length 7.5-9 mm. Napa, Plumas and Sacramento Cos., Calif. . . . . *clypeatus* Mots.

14. Clypeal margin rather deeply incised or emarginate at middle . . 15

Clypeal margin arcuate, transverse or but feebly emarginate at middle 21

15. Larger species, 8-13 mm. in length 16

Smaller species, body bronzed above, sparsely pubescent, pronotum rather sparsely, finely punctured 20

16. Body black clothed with fulvous or cinereous pile, pronotum coarsely, closely punctured 17

Body brown, sparsely, finely pilose, pronotum moderately finely, sparsely punctured 19

17. Third antennal segment distinctly longer and narrower than second, as long as fourth, clypeal margin semicircularly incised, prothorax as broad as long, legs somewhat rufous, head and pronotum densely clothed with golden or fulvous pile; length 10-11.5 mm. Atlantic States, especially southern Allegheny Mts . . . . *auripilis* Say

Second and third antennal segments small, of about equal length, together about as long as fourth, prothorax longer than broad 18

18. Head and pronotum densely clothed with fulvous pile; clypeus bilobed, elytral intervals always flat; length 10-13 mm. Northern Calif . . . . *fulvipilis* Cand.

Entire body rather sparsely clothed with cinereous or faintly fulvous pile, clypeal incision more V-shaped, elytral intervals often somewhat convex; length 9-11 mm. Northern Calif. to Idaho . . . . *fulvipilis seminudus* n. subsp.

19. Clypeal margin with a broad V-shaped emargination, second and third antennal segments each distinctly longer than broad, together longer than fourth; body brown, beneath slightly rufous, antennæ and tarsi red; elytral striæ fine and finely punctured, intervals flat and very finely punctured; length 9-13 mm. Ariz . . . . *sinuifrons* Fall

20. Second and third antennal segments each twice as long as broad, together much longer than fourth, first three antennal segments and legs red; length 6-7 mm. Eastern North America ....*quercinus* Say

Second and third antennal segments small, not much longer than broad, together not as long as fourth; hind angles of prothorax and legs red (in the var. *semiæneus* Lec., the elytra also are rufous); length 6-7 mm. Eastern North America.. ....*basillaris* Say

21. Larger and more robust species, at least 8 mm. in length...... 22

Smaller species.. 28

22. Clypeal margin evidently emarginate...................... 23

Clypeal margin transverse or vaguely emarginate............ 27

23. Prothorax distinctly longer than broad, sides evidently sinuate in front of hind angles.............................. 24

Prothorax broader than long, sides quite straight or even slightly arcuate in front of hind angles........................ 26

24. Second and third antennal segments rather short, third about two-thirds length of fourth; elytral striæ simply impressed, not sharply grooved, and coarsely, moderately closely punctured, the intervals subconvex and irregularly punctured and rugulose; body black, elytra often somewhat brownish, antennæ, legs and margins of elytra rufous, rather densely clothed with long, cinereous pile; length 9 mm. Eastern Colo., S. D., and Alberta.........................*ursinus* n. sp.

Second and third antennal segments moderately long, third almost length of fourth; elytral striæ finely though sharply grooved and finely closely punctured, intervals flat and with fine, more or less biseriately arranged punctures.......... 25

25. Body black or brown, somewhat bronzed above, antennæ, legs and margins of elytra rufous, sometimes also hind angles of prothorax and base of elytra; moderately clothed with fulvous pile; length 12-15 mm. Eastern North America.. ....*griseus* Beauv.

Body generally brown, less bronzed above, pronotum generally more coarsely, cribrately punctured; length 16 mm. (generally considered as little more than an enlarged form of the preceding). Middle States....................*interstitialis* Melsh.

26. Broad and very short, black, slightly æneous above, moderately pilose; pronotum moderately coarsely, not closely punctured except at sides, elytra finely striato-punctate, intervals broad, flat and finely, irregularly punctured, second and third antennal segments moderately long, in male almost as long as fourth, in female somewhat shorter; clypeal margin in female faintly emarginate, in male almost transverse; length 8 mm. Sonoma and Lake Cos., Calif................*kuschei* n. sp.

27. Second and third antennal segments short, together about equal or slightly longer than fourth, clypeal margin slightly arcuate, pronotum distinctly canaliculate at middle; elytral intervals rather densely triseriately punctured; body in general a piceous brown, slightly bronzed, above, moderately pilose and with legs and epipleuræ red; length 10 mm. Eastern Canada and northeastern States. *confusus* Lec.

Second and third antennal segments moderately long. Each about three-fourths length of fourth; clypeal margin truncate or faintly emarginate; pronotum but vaguely canaliculate at middle near base; elytral intervals somewhat regularly biseriately punctured, body otherwise quite similar to above; length 9-10 mm. Eastern States of America. . . . *plebejus* Say

28. Body above distinctly bicolored. 29

Body above black and unicolored. 30

29. Black, elytra brown, basal three segments of antennæ, apical and basal margin of prothorax including hind angles, margins of propleuræ, epipleuræ, tibiæ and tarsi and hind margins of ventral segments, rufotestaceous, clypeal margin transverse; antennæ short, in male barely reaching hind angles of prothorax, second and third segments rather long, the third the longer and about equal in length to fourth; pronotum very convex and finely, not very closely punctured; elytra finely striato-punctate, the intervals flat, finely, irregularly punctured and granulate; length 7.5 mm. Alaska and northern Canada. . . . . *pectoralis* Lec.

Very black, the elytra often with violet cast, head and pronotum a brilliant ruby color, shining, metallic, apices of hind angles of prothorax and prosternal lobe somewhat testaceous; clypeal margin emarginate; antennæ long, reaching well beyond hind angles of prothorax, second and third antennal segments small, together about equal to fourth, fourth to tenth broadly serrate; pronotum moderately convex and finely sparsely punctured; elytra coarsely striato-punctate, the intervals subconvex and deeply, rather coarsely irregularly punctured; length 6-7 mm. Lake States, Eastern Canada and Allegheny Mts. . . . . *aurifer* Lec.

30. Basal segments of antennæ and legs rufotestaceous. 33

Entire antennæ and legs black. 31

31. Broad robust species, prothorax as broad as long, antennæ rather short, third segment about as long as fourth. 32

Species more linear and subcylindrical, prothorax longer than broad and subparallel, clypeal margin vaguely emarginate at middle, antennæ long, extending well beyond hind angles of prothorax, second and third segments small, together about equal to fourth, fourth to tenth large and broadly serrate; prothorax finely, sparsely punctured; elytra rather finely striato-punctate, the punctures coarser at sides and apex, intervals finely, biseriately punctured; length 5-6 mm. Eastern Wash., Alberta............................*lanei* n. sp.

32. Prothorax parallel from base to about apical fourth, thence evenly arcuate to apical margin, pronotum coarsely, rather closely punctured, especially at sides, propleuræ coarsely, closely punctured; a small, black, subparallel species, subæneous above and very finely, sparsely pubescent; length 7-8 mm. Wash., Ore., and the higher mountains of Calif...*nitidulus* Horn.

Prothorax not parallel beyond middle, thence gradually arcuate to apex, pronotum less coarsely and rather sparsely punctured even at sides, propleuræ but moderately coarsely and not closely punctred even in front; somewhat broader and more æneous above than the preceding yet closely resembling it otherwise; length 7-8 mm. Higher elevations of Black Mts. of N. C.................................*beutenmuelleri* n. sp.

33. Small, elongate, black species, æneous above, head and pronotum rather finely, closely punctured, elytra finely striato-punctate, intervals somewhat flat and irregularly triseriately punctured as in the two preceding species; length 6-7 mm. Nova Scotia and New England west to B. C. and south through Rocky Mts. to N. M. and from the Cascade Mts. to Mt. Hood, Ore...............................*æger* Lec.

34. Larger species, 7.5 mm. or over in length.................... 35

Smaller species, 7 mm. or less in length..................... 44

35. Elytra unicolored or at most with epipleuræ of a different color.. 36

Elytra bicolored, black as is most of the insect, with humeri orange, portions of legs also often ferruginous; second and third antennal segments small, subequal, together about length of fourth; pronotum shining and finely, sparsely punctured; elytra distinctly striato-punctate, intervals flattened, finely irregularly punctured and rugulose; length 7.5 mm. Eastern Canada and Atlantic States, rare...........*stigma* (Hbst.)

36. Pronotum coarsely, closely and generally cribrately punctured.. 37

Pronotum more finely, less closely and not cribrately punctured.. 40

37. Clypeal margin not distinctly notched and depressed at middle, head and pronotum more or less æneous, anterior pronotal margin but slightly lobed at middle, elytral intervals not carinate apically; species in general robust and not markedly narrowed either in front or behind...................... 38

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Clypeal margin quite distinctly notched and depressed at middle in most cases, head and pronotum not evidently æneous though often shining, black or bicolored, anterior pronotal margin quite evidently lobed at middle; elytral intervals more or less carinate apically; females robust, males considerably narrowed both in front and behind.............. 39

38. Species in general black with head and pronotum æneous, elytra sometimes brown, distinctly pilose; second antennal segment slightly longer than broad, third still longer and subcylindrical, together longer than fourth especially in the female; elytra finely striato-punctate, intervals broad, flat and distinctly and irregularly punctured; length 8.5-12 mm. Pacific States..................................*californicus* (Mann.)

39. Species in general piceous with black head and prothorax and brown or slightly rufous elytra, lighter in females, pilose; second antennal segment hardly longer than broad, third longer, together about equal to fourth in male, longer in female; elytra rather coarsely striato-punctate anteriorly, more finely posteriorly; length 8-12 mm. Pacific States and Western Canada, mainly in sandy areas................*canus* Lec.

Rufotestaceous above, disk of pronotum piceous or pronotum all black; a lighter phase of above restricted to females; length 10-12 mm. Northern Calif. to Wash. and Idaho. .*canus discoideus* Lec.

40. Second and third antennal segment moderately long, second at least twice as long as broad and third much longer, as long as fourth; elytral intervals at most but vaguely subcarinate towards apex...................................... 41

Second and third antennal segments short, second not twice as long as broad and third though longer, not equal to fourth, elytral intervals subcarinate towards apex................ 42

41. Prothorax about as broad as long, gradually narrowed from base forwards, clypeal margin generally depressed and interrupted at center, elytral striæ often well impressed and usually rather coarsely punctured anteriorly and at sides; a robust, quite convex, blunt, and piceous brown species, somewhat æneous above, especially the pronotum, antennæ, legs and epipleuræ somewhat rufous; length 7 mm. N. Y., Penn., Ind. and Ohio....................................*dubitans* Lec.

Prothorax always slightly longer than broad, subparallel towards base, narrower from middle forwards, elytral striæ always fine and finely impressed; pronotum shining and with punctures generally well spaced; a variable species, very robust and blunt especially in females, disk of both pronotum and elytra somewhat flattened, dark piceous brown (*pilosulus* Cand.) to rufopiceous or even rufous, especially the elytra (var. *vernalis* Fall), the legs and epipleuræ lighter, the pronotum always æneous; length 11-14 mm. Pacific Slope ....*infuscatus* Mots.

42. Third antennal segment somewhat triangular and similar to fourth though smaller 43

Third antennal segment subcylindrical, always shorter and much narrower at apex than fourth; pronotum rather finely and closely to somewhat distantly punctured and more or less metallic; elytra with striæ distinctly impressed and somewhat coarsely punctured near the base, intervals irregularly punctured and slightly rugulose; clypeal margin transverse and but slightly depressed if at all at middle; propleuræ finely and closely punctured; a moderately robust species, narrowed apically, piceous brown, with elytra and legs lighter, brown or even rufous; length 7-12 mm. Eastern Canada and northeastern States..........*ectypus* Say (*agonus* Say)

43. Striæ rather finely and sharply impressed and finely punctured; clypeal margin slightly depressed at middle; pronotum convex, elongate and generally with sides subparallel or sinuate towards base, rather finely and sparsely to closely punctured, metallic and shining; propleuræ finely and but moderately closely punctured; a more or less elongate, subcylindrical species, piceous brown, head, pronotum and underside submetallic, elytra lighter, brown or rufous; length 7.5-12 mm. Eastern Wash. and Idaho to northern Calif. (a dichromatic species)...........................*subauratus* Lec.

Striæ fine but not sharply impressed, finely punctured, intervals also finely punctured; clypeal margin slightly depressed at middle; pronotum finely and moderately closely punctured, shining, metallic, propleuræ very finely punctured; body piceous with rufous antennæ, legs and elytra; length 8-9 mm. (This is probably only a phase or variety of *ectypus*). Eastern Canada and northeastern States..................*anceps* Lec.

44. Bicolored species.. 45

Unicolored species, black, shining, somewhat æneous above, clypeal margin transverse and distinctly reflexed, second antennal segment robust and longer than broad, third narrower and two-thirds length of fourth; pronotum finely, rather sparsely punctured, hind angles distinctly carinate; elytra finely striato-punctate, intervals flat and somewhat biseriately punctate; length 6.5-8 mm. Vanc. Is. to northern Calif.......................................*consimilis* Walk.

45. Prothorax and elytra both bicolored above.................. 46

Prothorax alone bicolored above.......................... 47

46. Black, basal angles or entire base of prothorax yellow, elytra variable from black with suture yellow, through both suture

and base yellow to all yellow; second and third antennal segments somewhat elongate though shorter than fourth; pronotum rather coarsely, closely punctured; elytra rather coarsely striato-punctate, intervals finely punctured; length 5-7 mm. Calif. . . . . *ornatulus* Lec.

A more pronounced black, with basal margin of prothorax and large humeral maculations orange, otherwise as above though generally smaller and more shining; length 5-6 mm. Mts. of middle and northern Calif. . . . . *ornatulus humeralis* Cand.

47. Pronotal punctures quite numerous but not approximate. 49

Pronotal punctures numerous and approximate. 48

48. Prothorax with sides and base rufous or rufotestaceous or base and hind angles alone colored; basal segments of antennæ and portions of legs also often testaceous; clypeal margin but slightly emarginate; second and third antennal segments each distinctly longer than broad but never equal to fourth; sides of prothorax generally evenly arcuate from base to apex, in a limited number sinuate in front of hind angles; elytra finely striato-punctate, the punctures but little coarser basally, intervals finely punctured and rugulose; propleuræ very coarsely, rather closely punctured, prosternum more finely and sparsely, and abdomen still more finely punctured; length 5-6 mm. Middle Calif. north to Vanc. Is. . *maculicollis* Mots.

Prothorax with basal margin alone flavous, basal segments of antennæ and portions of legs also often testaceous, general body color brown, never black as is usually the case with preceding species; clypeal margin transverse or vaguely emarginate; second and third antennal segments short, together but little longer than fourth; sides of prothorax either straight or slightly sinuate near base; elytra with striæ rather deep, the punctures quite coarse basally, intervals finely punctured and rugulose; propleuræ very coarsely yet rather distantly punctured, prosternum and abdomen quite finely and rather closely punctured; length 5 mm. Atlantic States. . . . . *definitus* Zieg.

49. Prothorax with basal and apical margins narrowly testaceous, basal segments of antennæ, legs and portions of prosternum also testaceous, basal color as in preceding but more bronzed; clypeal margin slightly emarginate; second and third antennal segments small, together about equal to fourth; sides of prothorax as in preceding species; elytra with striæ rather deep, the punctures very coarse basally, intervals finely punctured and rugulose; propleuræ very coarsely, closely punctured, prosternum finely, rather distantly and abdomen finely, closely punctured; length 3.5-4 mm. Atlantic States . . . . *nimbatus* Say

Limonius ulkei Horn

This species is not a synonym nor even a variety of *Limonius mirus* Lec. but a distinct species. It is in general more robust, of a different color, vermilion rather than yellow or orange, elytra with never more than a trace of black along the suture and at the apex, head and pronotum an inky blue-black rather than bronze, antennæ generally longer and more robust; prothorax almost as broad as long, gradually narrowing forwards, with the sides distinctly lobed near apex, and the disk grossly, cribrately punctured, in contrast to the prothorax of *mirus* which is always longer than broad, subparallel near base, with the sides barely lobed near apex and the disk more finely, densely punctured; elytra with the striæ finer, less deeply impressed, with small, somewhat linear punctures, the intervals broader and very flat in front, whereas in *mirus* the striæ are well impressed, punctured with large, rather round punctures and the intervals quite convex. Neither species is common, *ulkei* being very rare, though both frequent flowers.

Limonius pictus Van Dyke, new species

Elongate, subparallel; black, head and pronotum slightly æneous, basal half of elytra orange with large oval, black maculation on each elytron near base, the antennæ, tibiæ and tarsi rufo-piceous. Head moderately coarsely, deeply punctured, front flattened; clypeal margin faintly emarginate and slightly depressed at middle; antennæ reaching slightly beyond hind angles of prothorax in male, just reaching apex in female, second and third segments small though distinctly longer than broad, the second slightly longer and more robust than third, together about as long as the long fourth segment, fourth to tenth serrate and each about one-half longer than broad, the segments proportionally shorter in female. Prothorax slightly longer than broad, subparallel, apex moderately emarginate, base bisinuate, sides slightly sinuate near base, moderately convergent towards apex, apical angles small, vertically lamellate below, hind angles distinct, barely divergent, truncate at apex and without carinæ; the disk convex, obscurely canaliculate at middle behind, moderately coarsely, closely and deeply punctured, and finely, sparsely pubescent. Elytra three times as long as prothorax and as long as broad, subparallel in front, evenly rounded to apex, disk moderately convex, striæ distinctly impressed and closely, rather coarsely punctured, the intervals flat or slightly convex and faintly, biseriately punctured and rugose. Beneath coarsely, closely punctured on prothorax, finely, sparsely punctured on afterbody and clothed with sparse, fine cinereous pile, the anterior prosternal suture well separated in front and distinctly sulcate almost to middle. Length 8 mm., breadth 2 mm.

The female is in general slightly larger, with shorter antennæ, and broader and more convex prothorax. The elytral color pattern varies from that described as typical, on one hand towards a reduction in the size of the anterior maculation to the extreme on the other where these have not only united with each other but with the black apical patch leaving but a limited area at the base and sides orange.

Holotype: Male, No. 3133; and *Allotype:* Female, No. 3134, Mus. Calif. Acad. Sci., and several designated *Paratypes* in my collection, the first two from **Fallen Leaf Lake, Lake Tahoe, Calif.**, July 4th and 9th, 1915. This species is fairly abundant at higher altitudes in the northern Sierra Nevada Mts. and extends its range into the Cascades of Oregon and Washington. My series of forty or more specimens was beaten from fir trees, at the following localities: Yosemite Nat. Park, the Lake Tahoe region, Nevada Co., McCloud, Trinity Co., Calif., Klamath Falls, Ore., and Easton, Wash.

This moderate sized and very attractive species should be easily recognized by its color pattern, which is distinctive.

Limonius bicolor Van Dyke, new species

Elongate, subparallel, black, hind angles of prothorax, elytra, antennæ, tibiæ and tarsi red. Head moderately coarsely, sparsely punctured, front impressed, clypeal margin prominent, slightly emarginate at middle; antennæ in male reaching a segment and a half beyond hind angles of prothorax, barely reaching the apices of the angles in the female, second and third segments small, about equal in length, together hardly equal to fourth, fourth to tenth serrate, the outer about twice as long as broad, shorter in female. Prothorax slightly longer than broad, apex emarginate, anterior angles not prominent, base bisinuate, hind angles well marked, hardly divergent and truncate at apex, distinctly carinate, sides almost straight and slightly convergent forward, disk slightly convex, non-canaliculate, rather finely and sparsely punctured and pubescent, shining. Elytra perceptibly broader than prothorax and considerably more than twice as long; with sides gradually narrowing towards apex, more parallel anteriorly in females; disk convex, striæ well impressed and rather closely, distinctly punctured, the intervals somewhat convex and very finely, biseriately punctured. Beneath with prosternum rather finely, sparsely punctured, the propleuræ coarsely and closely and the afterbody rather finely and sparsely punctured, finely and sparsely pubescent, and with the anterior prosternal sutures well separated in front and distinctly sulcate, though latter not reaching the middle. Length 8 mm., breadth 2.25 mm.

The females differ from the males by having shorter antennæ and by being less narrowed both anteriorly and posteriorly.

Holotype: Male, No. 3135; and *Allotype:* Female, No. 3136, Mus. Calif. Acad. Sci., and several designated *Paratypes* in my collection, the first from **Fallen Leaf Lake, Lake Tahoe, Calif.**, June 30, 1915, and the second from Grass Lake, Lake Tahoe, Calif., June 24, 1915. In my series of more than a dozen are specimens collected at Sequoia Nat. Park, Plumas Co. and Trinity Co., and I have seen others from as far north as Victoria, B. C.

This species because of its rather small size and unicolored red elytra stands out conspicuously from its fellows.

Limonius nebulosus Van Dyke, new species

Moderately elongate and robust, rather blunt at both ends, rufotestaceous, head, prothorax and abdomen darker, often piceous, and the elytra more or less darkly clouded in the apical region. Head rather finely and moderately closely punctured, front deeply, broadly impressed, clypeal margin prominent and slightly arcuate; antennæ short, barely reaching hind angles of prothorax in male, segments two and three elongate, of about equal length, each about twice as long as broad and almost as long as fourth, segments four to ten slightly serrate, the outer about twice as long as broad. Prothorax somewhat longer than broad, apex and base emarginate, anterior angles not prominent, hind angles slightly divergent, subacute, acutely carinate, the carinæ prominent and almost one-third length of prothorax, sides slightly sinuate in front of hind angles, moderately but evenly arcuate at middle and gradually convergent forwards; the disk convex, indistinctly canaliculate at middle near base, rather finely and closely punctured, and sparsely, finely pilose, the pile semierect. Elytra a bit more than twice as long as prothorax, subparallel anteriorly, evenly rounded to apex, the disk convex, the striæ well impressed and moderately coarsely, closely punctured, finer apically, the intervals convex, very finely and irregularly punctured and rugose, the surface sparsely clothed with short, semierect pile. Beneath finely, sparsely punctured, the propleuræ more closely and coarsely punctured, the prosternal sutures of prothorax well separated in front and sulcate posteriorly to middle. Length 10 mm., breadth 2.75 mm.

Holotype: Male, No. 3137, Mus. Calif. Acad. Sci., collected by myself at **El Tovar, Grand Canyon, Ariz.**, July 26, 1926, and two *Paratypes,* one collected by Mr. W. F. Breeze at Castle Crags, Siskiyou Co., Calif., Sept. 1914, in my collection, the second with a piceous head and prothorax, from Pender

Harbor, B. C., collected by R. T. Turner, July 26, 1929, in the collection of Mr. Ralph Hopping. I have also seen a fourth specimen, collected by Mr. Warren Knaus at Zion Canyon, Utah, July 28, 1921.

This rather greasy looking species is related to *Limonius sinuifrons* Fall and like it has the facies of some of the more robust species of *Athous,* as for instance *cucullatus.* The color pattern though distinctive is not sharply contrasting for the lighter areas gradually give place to the darker. It is no doubt in the main a species of the more arid portions of the Great Basin though it extends into the mountains of northern California and even to the coastal area of British Columbia.

Limonius huguenini Van Dyke, new species

Robust and rather blunt at both ends, rufopiceous, maculations at base of elytra, faintly extending as broad vittæ, epipleuræ and legs flavous. Head moderately coarsely, closely punctured; front deeply, broadly, triangularly impressed, clypeal margin prominent, horizontal and truncate; antennæ short, reaching hind angles of prothorax, second and third segments slightly longer than broad, third somewhat longer and about three-fourths length of fourth, segments four to ten moderately dilated and serrate. Prothorax slightly longer than broad, apex and base emarginate, anterior angles distinct, hind angles triangular and slightly divergent, finely and acutely carinate, the carinæ about one-fourth length of prothorax, sides sinuate in front of hind angles, arcuate at middle and gradually narrowed to apex; disk convex, vaguely canaliculate near base at middle, moderately finely and not very closely punctured, and very finely, sparsely pubescent. Elytra slightly more than twice as long as prothorax, slightly arcuate at sides and evenly rounded at apex; the disk somewhat convex, striæ distinctly impressed and punctured, intervals slightly convex and indistinctly punctured and finely rugulose, the pile fine and sparse as on the pronotum. Beneath, moderately finely, closely punctured on prosternum, more coarsely and sparsely on propleuræ, and very finely, rather closely over abdomen; the prosternal sutures well separated in front and sulcate posteriorly for a short distance. Length 10 mm., breadth 3 mm.

Holotype: Female, No. 3138, Mus. Calif. Acad. Sci., collected in **Plumas Co., Calif.,** June 22, 1911, by Mr. Leon Munier and kindly presented to me by my good friend, the late Mr. J. C. Huguenin. Two other female specimens, quite similar, collected at Cayton, Shasta Co., Calif., July 1919, are in the collection of Mr. Ralph Hopping. With these, I have associated three small males, which I am confident though not positive, are the opposite sex of this species. They differ not only by being smaller, 6–7 mm. in length, but by being darker and more shining, less greasy in appearance; black with hind angles of prothorax or basal margin, basal margin of elytra, suture to a slight extent, and in two of the specimens, the basal segments of antennæ as well as legs, flavous; the head more transversely less deeply impressed, the clypeus not so thick, the head and pronotum more finely and sparsely punctured, the prothorax narrower, and the elytral striæ more coarsely punctured. They were collected by myself, two in Paradise Valley, Kings River Canyon, Fresno Co., Calif., July 16, and 23, 1910, and one at Tallac, Lake Tahoe, Calif., July, 1899.

This species belongs near *nebulosus* but differs in general by being less narrowed in front and behind, by having the front more deeply impressed in the female, the head and pronotum much more sparsely punctured, and the color pattern quite different. It, particularly the males, superficially looks very much like *Athous limbatus* Lec., an insect apt to be found in its same territory.

Limonius clypeatus Motschulsky

This long unrecognized species is a very distinct one and though rare, has been taken within recent years in the territory to the northeast of San Francisco Bay and not far from the type locality, "Nova Helvetia" or Sutter's Fort, as it was more commonly called by the California pioneers. I have studied eight specimens, seven from my own collection and one belonging to the California Academy of Sciences, all of which agree with the original description in regard to all major features, only differing slightly as regards the color pattern which is not constant. In all the specimens the clypeal margin is semicircularly incised and "distincte bidentato." The type was black except the mouthparts, antennæ, epipleuræ, "Elytrorum limbo subtus," and margin of abdomen and feet which were somewhat rufotestaceous. The Academy specimen collected near Chico, Calif., April 26, 1920, by Mr. E. P. Van Duzee, absolutely agrees with this description in all regards. In two of my specimens from Napa Co., the hind angles of the prothorax and elytra are also red, while in the remaining specimens from Plumas Co. the antennæ are black and the elytra as well except for a broad lateral margin of red. Some of the darker or more typical specimens look much like small specimens of *Limonius fulvipilis* Cand., but they are proportionately shorter and blunter, with the pile finer and shorter, the clypeus semicircularly emarginate not bilobed, the antennæ shorter, and the hind angles of prothorax more divergent.

Limonius fulvipilis seminudus Van Dyke, new subspecies

In the more typical forms which are found in middle California, both in the low Sierras and near the coast, the body is black, legs and antennæ somewhat rufous, and the head, pronotum and base of elytra densely clothed with long, silken, fulvous pile, the elytra posteriorly less densely clothed. It thus superficially very closely resembles the well known *auripilis*. In the mountains of northern California and again in eastern Washington and Idaho, there is a form which appears quite black for the vestiture is sparse, short and quite uniformly dispersed. The pile is also quite light, a fulvous gray. In the northern California forms the pronotum is in addition more coarsely, cribrately punctured and the elytral intervals somewhat convex while in the Washington and Idaho specimens the pronotal punctation is less coarse and close and the elytral intervals flattened as in the typical *fulvipilis*. The northern California forms, I am calling the subspecies **seminudus** and designating as a Holotype (No. 3139, Mus. Calif. Acad. Sci.), a specimen collected at **Carrville, Trinity County, Calif.**, July 1, 1913, and as paratypes, one other specimen from Trinity Co. and two from Siskiyou Co. The Washington and Idaho specimens, I am also associating with these.

Limonius ursinus Van Dyke, new species

Moderately elongate, robust, piceous brown, faintly bronzed above, elytra lighter, antennæ, epipleuræ, tibiæ and tarsi rufous, rather densely clothed with long cinereous pile. Head densely, coarsely punctured, front flattened, clypeal margin depressed at middle and as a result distinctly though not markedly bilobed; antennæ in male reaching just beyond apices of hind angles of prothorax, shorter in female, segments two and three moderately short, second but little longer than broad, third slightly longer and about two-thirds length of fourth, 4-10 serrate, the median hardly longer than broad, the outer somewhat longer. Prothorax distinctly longer than broad, apex broadly emarginate, hind angles broadly triangular, slightly divergent and with short though conspicuous carinæ; sides slightly sinuate in front of hind angles, barely arcuate at middle and gradually rounded and convergent to apex; the disk quite convex, vaguely canaliculate at middle near base, and coarsely, closely punctured. Elytra nearly three times as long as prothorax, very gradually narrowed posteriorly and rounded to apex, disk with striæ shallowly impressed but not sharply, and with moderately fine, somewhat distantly placed punctures, intervals slightly elevated and finely closely and irregularly punctured and rugose. Beneath moderately finely and sparsely punctured, the propleuræ rather coarsely, closely punctured and clothed with long pile similar to that of upper surface, the prosternal sutures distinctly opened and sulcate in front. Length 9 mm., breadth 3 mm.

Holotype: No. 3140, Mus. Calif. Acad. Sci., and *Paratype* in my collection, the first from **Fort Collins, Colo.**, collected May 12, the second from Volga, S. Dak. I also had a third, imperfect specimen from the latter locality and have seen a specimen from Medicine Hat, Alberta, belonging to Mr. F. S. Carr.

This very distinct species looks much like some of the hairy species of the subgenus *Pheletes,* especially *canus* and its allies, but it is always less narrowed behind, shorter and generally stubbier in appearance. It is probably not uncommon throughout the territory along the eastern flanks of the Rocky Mountains but has no doubt been confused with other species.

Limonius kuschei Van Dyke, new species

Rather short, broad and subparallel, black and clothed with short, semierect pile. Head coarsely, closely and rather cribrately punctured, front flattened, anterior margin of clypeus slightly emarginate; antennæ short, not reaching apices of hind angles of prothorax, second segment but little longer than broad, third longer and narrower but not as long as fourth, fourth to tenth moderately serrate, median segments as broad as long. Prothorax distinctly broader than long, apex faintly, base distinctly bisinuate, hind angles broadly triangular, barely produced, not divergent and with short yet distinct carinæ; sides divergent from base or barely sinuate in front of hind angles, arcuate at middle, then evenly rounded to apex; the disk very convex, sometimes vaguely canaliculate at middle near base, rather coarsely, deeply and rather closely punctured. Elytra two and one-half times as long as prothorax, subparallel to posterior third, dilated behind middle, and arcuate to apex, the disk finely, sharply striatopunctate, the intervals broad, flat and rather coarsely, closely and irregularly punctured. Beneath rather coarsely, closely punctured in front, very closely on propleuræ, gradually more finely and sparsely posteriorly, the prosternal sutures narrowly open and sulcate in front. Length 8 mm., breadth 2.75-3 mm.

Holotype: No. 3141, Mus. Calif. Acad. Sci., and two *Paratypes* in my collection, collected at **Eldridge, Sonoma Co., Calif.**, April 9-12, by Mr. J. A. Kusche.

This species is very short and robust, looking something like an abbreviated *californicus.* It also superficially resembles some of the larger and more robust specimens of *nitidulus* but is more opaque, has shorter antennæ, a much broader prothorax, less pronounced hind angles to the same, broader and flatter elytral intervals with closer and deeper punctures. Its general facies, particularly as regards its prothorax, is much like that of some of the more robust species of *Cardiophorus.* It is apparently a very rare and local species for the three specimens mentioned are the only ones that I have seen.

Limonius lanei Van Dyke, new species

Small, narrow, subcylindrical, black, slightly shining and æneous, and sparsely clothed with gray pile. Head finely, deeply but not closely punctured, front with a deep triangular impression in front, clypeal margin prominent and but vaguely emarginate at middle; antennæ long, reaching well beyond hind angles of prothorax, second and third segments small, together about equal in length to fourth, fourth to tenth markedly serrate and with all segments longer than broad. Prothorax distinctly longer than broad, apex bisinuate, slightly lobed at middle, base bisinuate, hind angles broadly triangular, not divergent, but moderately prominent, and each with a fine carina close to the margin, sides straight and slightly convergent forwards, rounded at front angles, disk convex, faintly canaliculate at middle near base, finely and sparsely punctured and shining. Elytra almost two and a half times as long as prothorax and slightly broader at base, sides parallel to posterior third thence arcuate to apex, disk with deep semicircular impression at base of each elytron, finely striatopunctate, the intervals flat, finely, irregularly, biseriately punctured. Beneath finely but distinctly and not closely punctured, more coarsely in front, the prosternal sutures of prothorax open in front and sulcate for a short distance backwards. Length 6.75 mm., breadth 1.75 mm.

Holotype: No. 3142, Mus. Calif. Acad. Sci., and three *Paratypes* in my collection, collected at **Lind,** eastern **Washington,** May 1, 1924, by Mr. M. C. Lane, after whom I take pleasure in naming it. Other specimens are also in the collection of Mr. Lane who kindly presented me with my series. I also have a specimen from Medicine Hat, Alberta, collected April 26, 1926, by Mr. F. S. Carr and others are in Mr. Carr's collection.

This interesting little species because of its elongated subparallel form, long and markedly serrate antennæ, and other physical characters shows that it is related to *aurifer,* but it can readily be separated from that by its color and the type of elytral punctation. From *æger* and other small æneous species, it can always be told by being less narrowed in front, by the type of its antennæ and color of legs.

Limonius beutenmuelleri Van Dyke, new species

Small, robust, black, distinctly shining and æneous, the tibiæ and tarsi piceous, and sparsely, finely pilose. Head rather coarsely, sparsely punctured, clypeal margin prominent and slightly arcuate; antennæ just reaching apex of hind angles of prothorax, second segment about a third longer than broad, third somewhat longer and equal to fourth, fourth to tenth serrate, the segments all slightly longer than broad. Prothorax as broad as long, apex slightly, base distinctly, bisinuate, hind angles broadly triangular, but slightly projected at apex, not divergent, and each with a well marked carina slightly diverging from lateral margin, the sides straight and parallel near base and arcuate and convergent from before middle to apex, disk convex, faintly canaliculate at middle near base, and finely yet deeply and sparsely punctured. Elytra two and a half times as long as prothorax, sides straight and slightly diverging to posterior third, thence, gradually arcuate to apex, disk finely striatopunctate, intervals flat or slightly convex and finely, irregularly biseriately punctured. Beneath rather finely, not closely punctured, the propleuræ more coarsely punctured, the prosternal sutures of prothorax distinctly opened and sulcate anteriorly. Length 7 mm., breadth 2.25 mm.

Holotype: No. 3143, Mus. Calif. Acad. Sci., and several designated *Paratypes* in my collection from a large series collected by myself on **Mt. Mitchell** and the tops of the adjacent peaks of the **Black Mountains** of **North Carolina,** June, 1902. It is named as a slight tribute to Mr. Wm. Beutenmueller, who was my travelling companion during my trip to the mountains of North Carolina.

This small, robust species has a surprising resemblance to *Limonius nitidulus* Horn of the Pacific Coast and no doubt had a common origin with that. It can readily be distinguished, however, by its generally broader form, more shining aspect, sparser and more distant punctation, and in having the sides of prothorax arcuate and narrowed from before the middle to apex.

BIBLIOGRAPHY

Limonius mirus Lec., Tr. Am. Phil. Soc., X, 1853, p. 429; Cand., Mon. Elat. III, 1860, p. 385.

Limonius ulkei Horn, Tr. Am. Ent. Soc., III, 1871, p. 314.

Limonius crotchi Horn, Tr. Am. Ent. Soc., IV, 1872, p. 148.

Limonius pictus n. sp.

Limonius venablesi Wick., Psyche, XX, 1913, p. 27; (Pheletes), Leng, Cat. Col., 1920, p. 168.

Limonius bicolor n. sp.

Limonius nebulosus n. sp.

Limonius sinuifrons Fall, Tr. Am. Ent. Soc., XXXIII, 1907, p. 227.

Limonius clypeatus Mots., Bul. Mosc., XXXII, III, 1859, p. 369.

Limonius auripilis (Say) (Elater), Jour. Acad. Nat. Sci. Phila., III, 1823, p. 172; Tr. Am. Phil. Soc., VI, 1836, p. 168; (Limonius), Lec., Tr. Am. Phil. Soc., X, 1853, p. 429; Cand., Mon. Elat., III, 1860, p. 382; Blatchley, Col. Ind., 1910, p. 756.

Limonius fulvipilis, Cand., Mon. Elat., III, 1860, p. 383.

Limonius fulvipilis seminudus n. subsp.

Limonius quercinus (Say) (Elater), Ann. Lyc. Nat. Hist. N. Y., I, 1825, p. 262; (Limonius), Lec., Tr. Am. Phil. Soc., X, 1853, p. 431; Dej., Cat., ed. 3, 1837, p. 103; Cand., Mon. Elat., III, 1860, p. 397; Blatchley, Col. Ind., 1910, p. 758.

Limonius basillaris (Say) (Elater), Jour. Acad. Nat. Sci. Phila., III, 1823, p. 172; (Limonius), Lec., Tr. Am. Phil. Soc., X, 1853, p. 431; Cand., Mon. Elat., III, 1860, p. 398; Blatchley, Col. Ind., 1910, p. 758.

Limonius basillaris var. semiæneus Lec., Tr. Am. Phil. Soc., X, 1853, p. 432; Cand., Mon. Elat., III, 1860, pp. 398-399.

Limonius ursinus n. sp.

Limonius griseus (Beauv.) (Elater), Ins. Afr. et Amer., 1805, p. 214, pl. 9, f. 8; (Limonius), Cand., Mon. Elat., III, 1860, p. 388; Cat. Method. Elat., 1891, p. 148; Blatchley, Col. Ind., 1910, p. 757.

? *cylindiformis* Hbst. (Elater), Käfer, X, 1806, p. 93, tab. 166, fig. 9.

cylindriformis Say (Elater), Jour. Acad. Nat. Sci. Phila., III, 1823, p. 176; Tr. Am. Phil. Soc., VI, 1836, p. 166; (Limonius), Lec., Tr. Am. Phil. Soc., X, 1853, p. 430.

hirticollis Melsh., Proc. Acad. Nat. Sci. Phila., II, 1846, p. 215.

perplexus Dej., Cat., ed. 3, 1837, p. 102.

propexus, Cand., Mon. Elat., III, 1860, p. 386; Cat. Method. Elat., 1891, p. 149.

Limonius interstitialis (Melsh.) (Corymbites), Proc. Acad. Nat. Sci. Phila., II, 1846, p. 215; (Limonius), Lec., Tr. Am. Phil. Soc., X, 1853, p. 430; Cand., Mon. Elat., III, 1860, p. 389; Blatchley, Col. Ind., 1910, p. 757.

diversus Dej., Cat., ed. 3, 1837, p. 102.

Limonius kuschei n. sp.

Limonius confusus Lec., Tr. Am. Phil. Soc., X, 1853, p. 430; Cand., Mon. Elat., III, 1860, p. 390; Blatchley, Col. Ind., 1910, p. 758.

ænescens Lec., Tr. Am. Phil. Soc., X, 1853, p. 431; Cand., Mon. Elat., III, 1860, p. 413; Cat. Method. Elat., 1891, p. 148.

Limonius plebejus Say (Elater), Am. Lyc. Nat. Hist. N. Y., I, 1825, p. 263; (Limonius), Lec., Tr. Am. Phil. Soc., X, 1853, p. 431; Cand., Mon. Elat., III, 1860, p. 390; Cat. Method. Elat., 1891, p. 148; Blatchley, Col. Ind., 1910, p. 758.

metallescens Melsh., Proc. Acad. Nat. Sci. Phila., II, 1856, p. 158.

Limonius pectoralis Lec., Proc. Acad. Nat. Sci. Phila., 1866, p. 391; Cand., Cat. Method. Elat., 1891, p. 148.

Limonius aurifer Lec., Tr. Am. Phil. Soc., X, 1853, p. 429; Dej., Cat., ed. 3, 1837, p. 102; Cand., Mon. Elat., III, 1860, p. 386; Cat. Method. Elat., 1891, p. 148; Blatchley, Col. Ind., 1910, p. 757.

Limonius lanei n. sp.

Limonius nitidulus Horn, Tr. Am. Ent. Soc., III, 1871, p. 315; Cand., Cat. Method. Elat., 1891, p. 149.

Limonius beutenmuelleri n. sp.

Limonius æger Lec., Tr. Am. Phil. Soc., X, 1853, p. 431; Cand., Mon. Elat., III, 1860, p. 397; Cat. Method. Elat., 1891, p. 148.

Limonius stigma (Hbst.) (Elater), Käfer, X, 1806, p. 86, pl. 166, f. 1; (Limonius), Dej., Cat., ed. 3, 1837, p. 102; Cand., Mon. Elat., III, 1860, p. 404; Cat. Method. Elat., 1891, p. 148; (Pheletes), Leng, Cat. Col., 1920, p. 168.

armus Say (Elater), Tr. Am. Phil. Soc., VI, 1839, p. 171; (Gambrinus), Lec., Tr. Am. Phil. Soc., X, 1853, p. 435; Lac., Gen. Col., IV, 1857, p. 183.

Limonius californicus (Mann.) (Cardiophorus), Bul. Mosc., XVI, 1843, p. 238 (136); (Limonius), Cand., Mon. Elat., III, 1860, p. 407; Cat. Method. Elat., 1891, p. 149; (Pheletes), Leng, Cat. Col., 1920, p. 168.

hispidus Lec., Tr. Am. Phil. Soc., X, 1853, p. 432; Cand., Mon. Elat., III, 1860, p. 407; (Pheletes), Leng, Cat. Col., 1920, p. 168.

Limonius californicus var. occidentalis Cand., Mon. Elat., III, 1860, p. 411; Cat. Method. Elat., 1891, p. 148; Horn, Tr. Am. Ent. Soc., III, 1871, p. 315; (Pheletes), Leng, Cat. Col., 1920, p. 168.

Limonius canus Lec., Tr. Am. Phil. Soc., X, 1853, p. 433; Cand., Mon. Elat., III, 1860, p. 413; Cat. Method. Elat., 1891, p. 149; (Pheletes), Leng, Cat. Col., 1920, p. 168.

subcostatus Mots., Bul. Mosc., XXXII, III, 1859, p. 370.

Limonius canus var. discoideus Lec., Proc. Acad. Nat. Sci. Phila., 1861, p. 348 Cand., Cat. Method. Elat., 1891, p. 148; Leng, Cat. Col., 1920, p. 168.

Limonius dubitans Lec., Tr. Am. Phil. Soc., X, 1853, p. 433; Cand., Mon. Elat., III, 1860, p. 407; (Nothodes), Lec., Smiths. Misc. Coll., III, Class. Col. N. Am., 1861, p. 171; Cand., Cat. Method. Elat., 1891, p. 174; Henshaw, List Col., 1885, p. 70; Leng, Cat. Col., 1920, p. 433.

Limonius infuscatus Mots., Bul. Mosc., XXXII, II, 1859, p. 371; Horn, Tr. Am. Ent. Soc., 1885, p. 69; Cand., Cat. Method. Elat., 1891, p. 148; Leng, Cat. Col., 1920, p. 168.

Limonius infuscatus var. pilosulus Cand., Cat. Method. Elat., 1891, p. 149; Leng, Cat. Col., 1920, p. 168.

pilosus Lec., Tr. Am. Phil. Soc., X, 1853, p. 433; Cand., Mon. Elat., III, 1860, p. 405; Henshaw, List Col., 1885, p. 69.

Limonius infuscatus var. vernalis Fall, Tr. Am. Ent. Soc., XXXVI, 1910, p. 129; Leng, Cat. Col., 1920, p. 168.

Limonius ectypus Say (Elater), Tr. Am. Phil. Soc., VI, 1839, p. 167; (Limonius), Lec., Tr. Am. Phil. Soc., X, 1853, p. 433; Cand., Mon. Elat., III, 1860, p. 409; Cand., Cat. Method. Elat., 1891, p. 149; (Pheletes), Leng, Cat. Col., 1920, p. 168.

agonus Say (Elater), Tr. Am. Phil. Soc., VI, 1839, p. 171; (Limonius), Lec., Tr. Am. Phil. Soc., X, 1853, p. 434; Cand., Mon. Elat., III, 1860, p. 410; Henshaw, List Col., 1885, p. 69; Cand., Cat. Method. Elat., 1891, p. 149; (Pheletes), Leng, Cat. Col., 1920, p. 168.

Limonius subauratus Lec., Tr. Am. Phil. Soc., X, 1853, p. 432; Cand., Mon. Elat., III, 1860, p. 406; Henshaw, List Col., 1885, p. 69; Cand., Cat. Method. Elat., 1891, p. 149; (Pheletes), Leng, Cat. Col., 1920, p. 168.

Limonius anceps Lec., Tr. Am. Phil. Soc., X, 1853, p. 433; Cand., Mon. Elat., III, 1860, p. 409; Henshaw, List Col., 1885, p. 69; Cand., Cat. Method. Elat., 1891, p. 149; (Pheletes), Leng, Cat. Col., 1920, p. 168.

Limonius consimilis Walk., Lord's Nat. Vanc., II, 1866, p. 325; Horn, Tr. Am. Ent. Soc., III, 1871, p. 316; Henshaw, List Col., 1885, p. 69; Cand., Cat. Method. Elat., 1891, p. 149; (Pheletes), Leng, Cat. Col., 1920, p. 168.

nitidicollis Lec., Ann. Mag. Nat. Hist., (4), IV, 1869, p. 378; Henshaw, List Col., 1885, p. 69; Cand., Cat. Method. Elat., 1891, p. 149; (Pheletes), Leng, Cat. Col., 1920, p. 168.

Limonius ornatulus Lec., Rept. Expt. and Surv. Miss. to Pac., XII, 1859, p. 46; Cand., Mon. Elat., III, 1860, p. 401; Henshaw, List Col., 1885, p. 69; Cand., Cat. Method. Elat., 1891, p. 148; (Pheletes), Leng, Cat. Col., 1920, p. 168.

Limonius ornatulus subsp. humeralis, Cand., Mon. Elat., III, 1860, p. 402; Horn, Tr. Am. Ent. Soc., III, 1871, p. 316; Henshaw, List Col., 1885, p. 69; Cand., Cat. Method. Elat., 1891, p. 148; (Pheletes), Leng, Cat. Col., 1920, p. 168.

Limonius maculicollis Mots., Bul. Mosc., XXXII, II, 1859, p. 372; Horn, Tr. Am. Ent. Soc., III, 1871, p. 316; Henshaw, List Col., 1885, p. 69; Cand., Cat. Method. Elat., 1891, p. 148; Leng, Cat. Col., 1920, p. 168.

discicollis Cand., Elat. Nouv., I, Mem. Acad. Sci. Brux, XVII, 1865, p. 49; Horn, Tr. Am. Ent. Soc., III, 1871, p. 316; Cand., Cat. Method. Elat., 1891, p. 148; Leng, Cat. Col., 1920, p. 168.

Limonius definitus Zieg., Proc. Acad. Nat. Sci. Phila., II, 1844, p. 268; Lec., Tr. Am. Phil. Soc., X, 1853, p. 434; Cand., Mon. Elat., III, 1860, p. 404; Henshaw, List Col., 1885, p. 69; Cand., Cat. Method. Elat., 1891, p. 149; (Pheletes), Leng, Cat. Col., 1920, p. 168.

Limonius nimbatus (Say) (Elater), Ann. Lyc. Nat. Hist. N. Y., I, 1825, p. 255; (Limonius), Lec., Proc. Acad. Nat. Sci. Phila., 1866, p. 391; Henshaw, List Col., 1885, p. 69; Cand., Cat. Method. Elat., 1891, p. 149; (Pheletes), Leng, Cat. Col., 1920, p. 168.

Limonius infernus Lec., Tr. Am. Phil. Soc., X, 1853, p. 434; Proc. Acad. Nat. Sci. Phila., 1866, p. 391; Cand., Mon. Elat., III, 1860, p. 403; Cat. Method. Elat., 1891, p. 149; (Pheletes), Leng, Cat. Col., 1920, p. 168.

Limonius debilis Dej., Cat. ed. 3, 1837, p. 103.

March 3, 1932

Genus **Leptoschema** Horn

This genus was established by Horn[17] for the reception of a peculiar species of Elateridæ originally described as *Agriotes protractus* Horn, and placed in the tribe Athoini. Its most distinctive characters are that the clypeal margin is short, free and well elevated above the labrum, the posterior coxal plates are gradually dilated inwards, and the prosternal sutures are double. The first two characters distinguish it from the tribe Agriotini where it had formerly been placed and it was in the main because of these that Horn removed it and placed it in a new genus at the same time putting it in the Athoini. With the members of the latter tribe, it agrees in having the free clypeal margin and certain other general characters, but it differs markedly from all of the genera included therein by having the head convex, the mouth inferior, and the hind angles of the prothorax prolonged and acute, as well as by its general facies and sculpturing. Though having some of the characters of *Agriotes,* I believe that, because of its type of hind coxal plates and certain other features, it belongs near *Sericus.* It most certainly does not belong in the Athoini. The typical species, *protractum,* is of a uniform piceous brown but there is a beautiful color variety which I will describe. The two species, *discalceatus* (Say) and *bicolor* (Lec.), provisionally placed in *Leptoschema* by Horn because of the double prosternal sutures, are not at all congeneric with *protractum.* They are in every regard species of *Athous* except for the type of prosternal suture and should as a result be removed from *Leptoschema.*

As much as they cannot go into *Athous,* they should be placed in another genus and fortunately we have this in *Elathous* Reitt.,[18] a genus founded for the reception of two European species which are truly congeneric with them. This genus has for some time been considered as a synonym of *Leptoschema* but it is not, their genotypes not being congeneric. In addition to the characters given by Horn for

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[17] Trans. Am. Ent. Soc., XII, 1884, p. 50.

[18] Ent. Nachricht., XVI, 1890, pp. 247-248.

Leptoschema, we should add small eyes, for those of *protractum* (Horn) are much smaller proportionally than they are in *Agriotes.*

Synoptic Table

Body piceous brown, the elytra generally lighter, often somewhat rufous.................................... *protractum* (Horn)

Body piceous, the entire upper surface a rich orange yellow except portions of head and a longitudinal vitta at middle of pronotum, the propleuræ and tarsi also yellow.............. .... *protractum* var. *elegans* n. var.

Leptoschema protractum var. **elegans** Van Dyke, new variety

This variety differs from the more or less uniformly piceous brown form by having the prothorax, except the sternum and a longitudinal pronotal vitta at the middle, and the elytra, of a rich orange yellow color. The head and terminal portions of the legs are also somewhat yellowish. The general form and sculpturing is the same as in the typical phase.

Holotype: No. 3144, Mus. Calif. Acad. Sci., a specimen collected in **Humboldt Co., Calif.,** May 15, 1911, by Mr. F. W. Nunenmacher. Another specimen has also been seen. The typical forms have all been found in the coastal portions of middle California.

Genus **Elathous** Reitter

The species of this genus resemble somewhat the species of *Athous* related to *Athous cucullatus* (Say), particularly in regard to the robust form, deeply impressed front, and carinate hind angles of prothorax, but they differ materially in having the double prosternal sutures and the tarsi narrower and without lobes. From the members of *Athous* like *rufifrons* Rand., which have no tarsal lobes or but vague ones, they differ by having well developed carinæ on the hind angles of the prothorax, double prosternal sutures, and tarsi that are more cylindrical and with a shorter second and generally longer fourth segment, similar in many ways to that of *Limonius.* Our

American species are all of a somewhat piceous, brown or rufous color, with the ventral surface very much lighter, generally rufotestaceous; the second and third antennal segments small though usually longer than broad, the third sometimes the longer, and together as long or longer than the fourth, and the antennæ as a whole not or hardly reaching the apices of the hind angles of the prothorax in the female and but slightly longer in the male. *Elathous oberndorfferi* O. Schwarz[19] is without doubt but a synonym of *discalceatus* (Say).

Synoptic Table

1. Pronotum quite coarsely, numerously and generally approximately punctured even at middle; elytra finely striate and with distinct punctures, the intervals slightly convex and finely but distinctly and numerously punctured and subrugose... 3

Pronotum with punctures not approximate on disk; elytra finely striate, the punctures very fine, often indistinct, intervals flat or hardly convex and finely, somewhat indistinctly, punctured and shining.............................. 2

2. Head very coarsely, closely and cribrately punctured; the pronotal punctures likewise coarse and umbilicate, somewhat finer on disk; prothorax generally but moderately narrowed in front, with sides but slightly sinuate behind, and with elytra very finely and closely clothed with suberect pile.. ....*discalceatus* (Say)

Head but moderately coarsely and not cribrately nor approximately punctured; the pronotal punctures somewhat similar on the sides, but always well spaced, finer and sparser on the disk; prothorax always distinctly narrower in front and with sides slightly sinuate behind, making the hind angles quite divergent; the entire upper surface sparsely clothed with short, less erect pile.......................*californicus* n. sp.

3. Head rather coarsely and closely, not cribrately punctured; the prothorax slightly and gradually narrowed in front, the sides slightly sinuate behind; the entire upper surface clothed with very fine and suberect pile.....................*bicolor* (Lec.)

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[19] Wien. Ent. Zeit., XXII, 1903, p. 207.

Elathous californicus Van Dyke, new species

Elongate, slightly depressed, subparallel, somewhat narrowed in front and behind, sparsely pilose; dark piceous brown, almost black in holotype, the basal margin of prothorax, elytral suture and epipleuræ, antennæ and entire underside rufotestaceous. Head triangularly depressed in front, clypeus prominent and with anterior margin arcuate, front moderately coarsely but not closely punctured; antennæ in male reaching one segment beyond hind angles of prothorax, in female not quite reaching apex of hind angles, the second segment small, slightly longer than broad, third longer, about twice as long as broad, together barely longer than fourth in male though distinctly longer in female. Prothorax slightly longer than broad in male, as broad as long in female, with hind angles prominent, divergent, blunt at apex, and distinctly carinate, the sides sinuate in front of angles, slightly arcuate at middle and gradually narrowed toward apex, the apex four-fifths as broad as base, lateral margin fine, disk convex and rather coarsely, somewhat numerously punctured, the punctures but little coarser laterally and always well spaced, median canaliculation vague even near base. Scutellum rather finely punctured. Elytra over two and a half times as long as prothorax, in male gradually narrowed almost from humeri to apex, in female subparallel anteriorly, the disk finely striate and very finely punctured, the intervals flattened, finely, irregularly punctured and indistinctly rugulose. Beneath moderately coarsely, closely punctured in front, more finely behind. Male, length 11 mm., breadth 3 mm.; female, length 12 mm., breadth 3.5 mm.

Holotype: Male, No. 3145; and *Allotype:* Female, No. 3146, Mus. Calif. Acad. Sci., and three *Paratype* females, besides an imperfect male, in my collection. The first was from **Strawberry Valley, Eldorado Co., Calif.**, Aug. 6, 1912, the second from Tallac, Lake Tahoe, Calif., Aug. 1912, the others from Meadow Valley, Plumas Co., Calif., July 1914, Quincy, Calif. July 1915, and Tallac, Aug. 1912. These were all found beneath the bark or in the wood of dead yellow pines, being truly lignivorous, as I believe are all members of the genus.

This species resembles quite closely our other species but is in general darker above, more narrowed in front, with more prominent and divergent hind angles to prothorax, a somewhat finer and less closely punctured head and pronotum and more finely punctured elytral striæ.

BIBLIOGRAPHY

Leptoschema protractum (Horn) (Agriotes), Tr. Am. Ent. Soc., III, 1871, p. 317; (Leptoschema), Horn, Tr. Am. Ent. Soc., XII, 1884, p. 50; Cand., Cat. Method. Elat., 1881, p. 200.

Leptoschema protractum elegans, n. var.

Elathous discalceatus (Say) (Elater) Say, Tr. Am. Phil. Soc., VI, 1839, p. 169; (Athous), Lec., Tr. Am. Phil. Soc., X, 1853, p. 427; Cand., Mon. Elat., III, 1860, p. 455; (Leptoschema), Horn, Tr. Am. Ent. Soc., XII, 1884, p. 51; Cand., Cat. Method. Elat., 1891, p. 201; Blatchley, Col. Ind., 1910, p. 761.

oberndorfferi O. Schwarz, Wien. Ent. Zeit., XXII, 1903, p. 207.

Elathous californicus, n. sp.

Elathous bicolor (Lec.) (Athous), Lec., Tr. Am. Phil. Soc., X, 1853, p. 428; Cand., Mon. Elat., III, 1860, p. 486; (Leptoschema), Horn, Tr. Am. Ent. Soc., XII, 1884, p. 51; Cand., Cat. Method. Elat., 1891, p. 201; Blatchley, Col. Ind., 1910, p. 761.

Genus **Athous Eschscholtz**

The genus *Athous* has the clypeus distinctly margined and elevated in front, the mouth anterior, the posterior coxal plates gradually dilated inwards, the first tarsal segment greatly elongated, the fourth usually quite small, and several of the median segments with posterior projecting lobes beneath, the prosternal lobe long and the prosternal sutures single. Other characters are quite variable. In fact the genus is decidedly polymorphic for the front may be flattened, sulcate or deeply triangularly impressed; the posterior prothoracic angles carinate or not carinate; the median tarsal segments lobed or not lobed; or the antennæ varying from the filiform to the usual serrate or even flabellate type and with the basal segments of varying length. There is often a great difference between the sexes as to size, length of antennæ, and so forth; and in many species a great deal of variability as to color. In a number of our species, particularly those confined to the Pacific Coast, there are several geographical color races and a few are quite decidedly dichromatic, having within the same territory both a black or dark phase as well as a lighter one, especially one with lighter elytra. This has also been noted in *Limonius* as indicated previously and it occurs here and there in *Ludius*.

The genus is dominantly holarctic, with a large number of species in all the major portions of that region. The bulk of the species dwell in the mountains, especially in heavily forested areas, much as *Limonius* shows a preference for the valleys and more open places.

In Europe, there has been a tendency to divide up the genus into subgenera or even to separate off several of the groups as distinct genera. This classification if applied to our species would lead to great confusion and at the same time give the impression that many of the species were widely separated whereas they are but slightly divergent elements of a common stock. I have, therefore, thought it best to ignore these groupings. Some of our species superficially resemble those of other genera and a typical species as well as individuals have often been placed elsewhere. A study of the species in relation to the essential characters should prevent this confusion. I have removed *Limonius ornatipennis* Lec. from *Limonius* and placed it in *Athous,* the long first and short fourth tarsal segment being essentially characteristic of the latter and not of the former. Other characters also back this up. I have also placed *Corymbites polygenus* Fall here. Fall's type specimen was atypical of the species. Typical specimens are *Athous* in every regard. *Athous debilis* Lec. *(debilitarsus* Cand.) is a *Monocrepidius; Athous trivittatus* Melsh. a European species according to LeConte; and *Athous quadrivittatus* Walker, an immature specimen of *Ludius (Corymbites) lateralis* Lec., according to LeConte.[20] I have, therefore, dropped these from the genus *Athous. Athous exclamationis* O. Schwarz, I have not been able to place and am inclined to believe was never found in our territory as is the case without doubt, of a number of the Elateridæ described as from this country by O. Schwarz. Collectors are at times notoriously careless with their material as regards locality labels and have thus often misled the describer. A number of previously listed species will also be reduced to subspecific rank.

The arrangement of the species in the bibliography shows their phylogenetic relationship better than that given in the synoptic table.

SYNOPTIC TABLE

1. Tarsi not distinctly lobed beneath, second and third tarsal segments at most slightly prolonged backwards and beneath, hind angles of prothorax not carinate.................... 2

Tarsi with one or more segments evidently lobed beneath or prolonged backwards at least on first pair of legs............ 5

2. Front deeply impressed with prominent clypeal margin, second antennal segment small, third almost as long as fourth.... 3

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[20] Syn. Notes on N. Am. Col., by John L. LeConte, Ann. Mag. Nat. Hist. (4), vol. 6, 1870, p. 7.

Front feebly impressed, clypeal margin but moderately prominent, second and third antennal segments about equal in length and each two-thirds length of fourth.............. 4

3. Piceous or vittate species, anterior prothoracic angles prominent, scutellum as broad as long, intermediate antennal segments distinctly serrate, tarsi quite filiform; length 11-15 mm. Lake Superior to eastern Canada and Maine, and Allegheny Mts.......................................*rufifrons* (Rand.)

Rufotestaceous, anterior prothoracic angles not prominent, scutellum narrow, longer than broad, prothorax with sides straight and parallel, the disk but slightly convex, the intermediate antennal segments elongated and parallel sided, filiform; length 12 mm. Black Mts., N. C.........*appalachius* n. sp.

4. Small species, piceotestaceous, with sides of prothorax posteriorly, an elytral vitta extending from humeri to beyond middle and including most of fifth, sixth and seventh intervals, transverse oval patches extending from third intervals to margin at posterior third, a triangular area at apex, and feet, rufotestaceous; antennæ short, prothorax considerably longer than broad and moderately coarsely, closely and somewhat aciculately punctured, elytra distinctly striato-punctate, intervals rather markedly punctured and surface clothed with short, suberect pile; length 6 mm. Middle States, uncommon.......................................*ornatipennis* (Lec.)

5. Anterior tarsi with second and third segments slightly lobed beneath, middle and hind legs with tarsi not distinctly lobed; rufotestaceous, generally with base of head, somewhat elliptical median pronotal vitta, and broad sutural and lateral vittæ near side margin of elytra, black; second antennal segment longer than broad, the third as long or longer than fourth, front deeply triangularly impressed, pronotum moderately coarsely, closely punctured, intervals slightly convex and finely punctured, general surface rather sparsely, finely, pilose; length 7-11 mm. B. C. to northern Calif. along coast...*vittiger* Lec.

All tarsi with some segments evidently prolonged or lobed beneath.. 6

6. Hind angles of prothorax not distinctly carinate (females of *rufiventris* Esch. with angles sometimes finely carinate).... 7

Hind angles of prothorax distinctly carinate in both sexes..... 31

7. Hind angles of prothorax short, broad and earlike, fourth tarsal segment quite small................................ 8

Hind angles of prothorax somewhat prolonged and acute, fourth tarsal segment but little shorter than third, the three middle segments all distinctly lobed beneath (the genus *Harminius* Fairm.)... 30

8. Second antennal segment short, third much longer, almost as long as or equal to fourth, front deeply impressed, clypeal margin prominent, antennæ long and more or less filiform.. 9

Second antennal segment longer than broad, generally twice as long as broad and but slightly shorter or equal to third, the latter never as long as fourth, front flattened or sulcate, clypeal margin but little elevated at middle.............. 22

9. Punctures of pronotum rather fine, not umbilicate............ 10

Punctures of pronotum, broad, shallow and more or less umbilicate.. 17

10. Second and third tarsal segments distinctly prolonged beneath, forming well marked lobes........................... 11

Second tarsal segment almost cylindrical, third but slightly lobed beneath, fourth segment somewhat more elongate or more evident than in preceding group....................... 14

11. Larger species, over 9 mm. in length, pronotum moderately coarsely punctured................................. 12

Smaller species less than 9 mm. in length, pronotum very finely punctured.. 13

12. Prothorax always somewhat narrowed in front, rather densely punctured and quite densely clothed with long cinereous pile, last segment of maxillary palpi over twice as long as broad; reddish brown to piceous, head and pronotum darker, elytra coarsely striato-punctate, intervals convex and surface sparsely though evidently pilose; length 11-15 mm. Common throughout Atlantic States............*brightwelli* (Kirby)

Prothorax hardly narrower in front than behind, conspicuously but not densely punctured and but sparsely pubescent, last segment of maxillary palpi hardly twice as long as broad, rufotestaceous with head piceous behind and an elongate black area on disk of pronotum (typical species) and varying to all piceous or black with head, sides of prothorax and often large humeral patch red, elytra coarsely striato-punctate (more finely in var. *angelicus*), intervals somewhat convex, sparsely pilose; length 10-13 mm. Calif., chiefly along coast.......................................*excavatus* (Mots.)

13. Narrow, elongate, testaceous with back of head and disk of pronotum slightly piceous, second segment of antennæ but one-half length of third, prothorax more or less quadrate, little longer than broad, disk very finely, sparsely punctured. Elytra with well marked transverse rugæ between strial punctures enhancing the prominence of punctures, surface finely, sparsely pilose; length 8.5 mm. Black Mts., N. C... ....*carolinus* n. sp.

Narrow, elongate, piceous or rarely testaceous, with or without lateral margins of prothorax rufous, second segment of antennæ over one-half length of third, prothorax subparallel and distinctly longer than broad, pronotum rather finely and moderately closely punctured especially at sides, elytra with rugæ between strial punctures less evident especially at sides, surface sparsely pilose; length 6-8 mm. Eastern States.......................................*acanthus* (Say)

14. Large black species, 13 mm. or over in length, shining and with fine, closely appressed and inconspicuous pile over entire upper surface.................................... 16

Species of medium size, with pile on upper surface sufficiently long and dense to be quite evident, the cinereous or fulvous pile of head and pronotum on its dark background a noticeable feature.. 15

15. Prothorax with sides but slightly if at all sinuate in front of hind angles, generally quite parallel for basal half or three-fourths, head and pronotum densely, closely punctured and with long, flying hairs quite evident, elytral striæ sharply impressed and closely punctured, the intervals slightly convex and distinctly irregularly punctured, third and fourth tarsal segments evidently prolonged beneath and slightly lobed, color variable, head, prothorax and scutellum always piceous or black, the elytra varying from orange through brown to black, legs black or yellow in lighter phases; length 10-15 mm., average 10-12 mm. Alaska, south to northern California, along coast, through the Cascades and Sierra Nevada and into northern Rocky Mts.................*pallidipennis* Mann.

Prothorax with sides noticeably sinuate, especially in males, in front of hind angles, angles slightly divergent, head and pronotum finely and but moderately closely punctured, the flying hairs but rarely evident; elytra with striæ evident but not sharply defined and distinctly punctured, the intervals but slightly convex and finely rugulose, so that punctation generally is vague; third and fourth tarsal segments barely prolonged beneath and but faintly lobed; color brown to piceous, head and prothorax darker, piceous or black, scutellum never black; length 10-12 mm. San Francisco Mts. of N. M...................................*coquerelli* Reitt.

16. Head and pronotum deeply, rather coarsely, closely and regularly punctured, somewhat umbilicate at sides, prothorax with sides straight posteriorly or slightly sinuate in front of hind angles and arcuate at middle, hind angles at times with vague carinæ (the var. *ingens* Fall); elytra deeply and coarsely punctured, the intervals varying from very convex in typical to quite flat in large females of var. *ingens;* third and fourth tarsal segments slightly prolonged beneath and slightly lobed; length 13-22 mm. Western Wash. south to northern Calif., along coast and throughout Sierra Nevada Mts...*scissus* Lec.

17. Front deeply triangularly sulcate, the clypeal margin sharply defined but depressed at middle........................ 21

Front triangularly impressed, the clypeal margin thick and prominently elevated throughout entire extent................ 18

18. Elytra deeply striate, the intervals convex.................. 19

Elytra finely striate, the intervals flat...................... 20

19. Prothorax not distinctly longer than broad, the punctures coarse, umbilicate even on disk and closely placed, hind angles sometimes finely carinate in females; antennæ not extending more than three segments beyond hind angles of prothorax and with segments 3-7 evidently triangular; second and third tarsal segments evidently prolonged beneath and lobed, fourth small; color varying from all rufotestaceous to nigropiceous; length 8-12 mm. Alaska south through B. C. and Pacific States to coastal area of northern Calif. and to northern Rocky Mts..............................*rufiventris* (Esch.)

Prothorax distinctly longer than broad, entire insect very long and narrow, the punctures of pronotum but moderately coarse, distinctly umbilicate only at sides, and not closely placed even laterally; antennæ very long, extending four segments beyond hind angles of prothorax in male, segments 3-6 but slightly triangular; third and fourth tarsal segments but slightly prolonged beneath and lobed, the fourth but little smaller than third; color rufotestaceous; length 12 mm. Mts. of northern N. M.......................*rufotestaceous* Fall

20. Head and pronotum very coarsely, umbilicately and closely punctured; antennæ not extending more than three segments beyond hind angles of prothorax, segments 3-6 but slightly triangular; third and fourth tarsal segments slightly dilated and lobed beneath; color black with legs, antennæ and elytra nigropiceous or brownish; length 10 mm. Rocky Mts. of southern Colo. and northern N. M.........*cribratus* Lec.

21. Head and pronotum coarsely, approximately punctured and clothed with conspicuous yellowish pile; antennæ extending three segments beyond hind angles of prothorax in males; segments 3-5 distinctly triangular; first and second tarsal segments quite cylindrical, third very distinctly prolonged beneath and lobed, the fourth small and cylindrical; color black with hind angles of prothorax, elytra and legs reddish yellow, the general surface subopaque; length 9-10 mm. Calif. from Los Angeles north to San Mateo Co.....*agriotoides* Fall

22. Second and third antennal segments about equal in length and each but little shorter than fourth, the antennæ as a whole not reaching hind angles of prothorax; head and pronotum rather coarsely, very closely, somewhat aciculately punctured; hind angles of prothorax short and broad.......... 23

Second and third antennal segments rather short, the third a little longer than second (considerably longer in male of *palpalis*) and distinctly shorter than fourth, punctation of pronotum moderately close.......................... 24

23. Prothorax distinctly longer than broad; front flattened, slightly impressed in front and with clypeal margin slightly reflexed; second and third tarsal segments but slightly prolonged beneath and lobed; color variable, black with hind angles of prothorax and legs yellow and elytra varying from black with yellow humeral patches or broad yellow vittæ to entirely yellowish red or rufous (anterior angles or apical margin of prothorax also often flavous); length 6-11 mm. Sierra Nevada and mountains of northern Calif. extending to B. C. ....*imitans* Fall

Prothorax fully as broad as long; front flattened, clypeal margin not reflexed; second and third antennal segments evidently prolonged beneath and lobed; color brown to piceous, elytra lighter, anterior and posterior margin of prothorax, basal margin of elytra and epipleuræ flavous, basal segments of antennæ as well as outer parts of legs lighter; length 5.5-8 mm. Northern Calif. generally on hillsides on scrub oak.*brevis* n. sp.

24. Elytra entirely rufous or brown.......................... 25

Elytra black or bicolored, antennæ reaching hind angles of prothorax or extending beyond.......................... 29

25. Second and third antennal segments rather small, together about as long as or barely longer than fourth.................. 26

Second and third antennal segments longer, together distinctly longer than fourth; front broadly sulcate, clypeal margin slightly reflexed at sides; pronotum rather finely though closely punctured; second tarsal segment not evidently lobed but third very distinctly lobed; reddish brown with head piceous and legs lighter; length 5-6 mm. Southwestern Ore. and northwestern Calif.........................*palpalis* Fall

26. Front broadly sulcate, elytra always markedly rufous; somewhat larger species, over 8 mm. in length..................... 28

Front flattened or at most very shallowly sulcate............. 27

27. Clypeal margin narrow but distinctly reflexed; antennæ reaching slightly beyond hind angles of prothorax, second and third segments together barely longer than fourth; prothorax slightly longer than broad, hind angles short and broad, disk moderately coarsely, closely, somewhat aciculately punctured; elytra moderately flattened, striæ fine and distinctly though not coarsely punctured, intervals flat and almost as coarsely punctured as striæ; color brown with slight reddish tinge, antennæ, side margins of elytra and legs more rufous; length 8 mm. Los Angeles, Calif....*sordidus* n. sp.

Clypeal margin well defined but not reflexed, front broadly and shallowly excavated; antennæ not reaching hind angles of prothorax, second segment as broad as long, the third longer, about two-thirds length of fourth, the intermediate segments hardly serrate; prothorax slightly longer than broad, hind angles short and broad, disk rather coarsely and moderately closely punctured; elytra distinctly punctato-striato, intervals punctured but not conspicuously so and shining, and surface pilose; third segment of anterior tarsi alone lobed beneath, the second pair of legs with third tarsal segment but slightly elongated posteriorly; piceous with elytra rufous and antennæ and legs rufopiceous; length 8 mm. Dutch Flat, Calif........................*rufipennis* n. sp.

28. Clypeal margin sharply defined throughout, pronotum rather coarsely, evenly and closely punctured, canaliculation vague, second and third tarsal segments slightly prolonged beneath and lobed, black with rufous elytra and rufo-piceous antennæ and legs; length 9.5-11 mm. Middle Sierra of Calif.....*essigi* n. sp.

Clypeal margin sometimes sharply defined throughout or slightly depressed at middle, pronotum moderately, coarsely punctured, distantly on disk and closely on sides, canaliculation pronounced, second tarsal segment but slightly prolonged beneath, the third more evidently prolonged and lobed, entirely rufous or with head, a broad discal area and side margins of prothorax black; length 8-12 mm. Coastal counties of middle Calif.............................*polygenus* (Fall)

29. Front flattened, clypeal margin well defined but not prominent, head and pronotum coarsely, closely punctured, pronotum slightly canaliculate at middle near base, elytra deeply striate, the striæ rather coarsely punctured, intervals convex, finely punctured and somewhat rugulose, upper surface evidently pilose, the pile cinereous on head and pronotum and interspersed with flying hairs; color black, sometimes with hind angles and basal margin of prothorax, basal margin, adjacent portion of suture, and epipleuræ of elytra, mouthparts and portions of legs rufous; length 9-11 mm. Southern Calif.......................................*discrepans* Reitt.

Front somewhat convex, clypeal margin sometimes slightly elevated, head and pronotum moderately, finely, rather closely punctured, prothorax but vaguely canaliculate at middle, front angles prominent and obliquely truncate, hind angles short and broad, elytra striato-punctate, intervals slightly convex; color black with hind angles of prothorax, a broad vitta extending back from elytral humeri almost to middle, a broad maculation at posterior third reaching from sides almost to suture, a triangular patch at apex, epipleuræ, and basal segments of antennæ and legs orange; length 6-7 mm. Ohio and middle Sierra Nevada Mts. of Calif........*opilinus* Cand.

30. Larger species, front slightly impressed, clypeal margin but little elevated; antennæ reaching beyond hind angles of prothorax, second segment small, third large and triangular like following and slightly longer than fourth; head and pronotum coarsely, densely, very closely punctured, prothorax broader than long, disk canaliculate at middle posteriorly, hind angles prominent, divergent and subacute, elytra deeply striate, the striæ finely impressed, intervals convex and finely rugulose; color black with front and sides of head and greater portion of sides of pronotum rufous, elytra brown with basal triangle and two broad oblique bars clearly defined by being denuded of pile, the surface elsewhere as also the head and pronotum finely, densely pilose; length 15 mm. Hudson Bay and Lake Superior regions, also northern Europe and Asia .... *undulatus* (DeG.)

Smaller species, quite similar to preceding, head and pronotum densely, closely punctured, prothorax longer than broad, disk canaliculate at middle and hind angles prominent and divergent, elytra distinctly punctato-striate, the intervals flattened and finely punctured; color nigropiceous, prothorax with median rufous vitta extending from base to apex (type)[21] or all black (Katmai specimen),[22] the elytra reddish with three undulating oblique fasciæ produced by absence of pile or with two fasciæ and entire apex denuded; length 7 mm. Sitka and Alaska Peninsula...... *triundulatus* Mann.

31. Second segment of antennæ short, third very long, almost as long or even longer than fourth........................ 32

Second and third antennal segments short, together about as long as fourth.................................... 40

32. Subopaque species, head and pronotum closely, shallowly, umbilicately punctured, elytra finely scabrous............... 33

More shining species, pronotal punctures not so closely placed, deeper and less umbilicate on disk, black or brown, sometimes with slight color pattern......................... 35

33. Sooty black, unicolorous, front triangularly impressed, clypeal margin thick and reflexed; antennæ reaching hind angles of prothorax, second segment small, third almost equal to fourth, third to ninth serrate; prothorax about as broad as long, punctures of head and pronotum fine but very distinct, hind angles of prothorax broad and short, not divergent, carinæ fine and slightly divergent from side margin, elytra distinctly striato-punctate, intervals somewhat elevated and

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[21] Bull. Mosc., XXVI, 1853, p. 222.

[22] The Coleoptera Collected by the Katmai Exped., by Edwin C. Van Dyke, Contrib. Tech. Ser., Nat. Geogr. Soc., Wash., 1924, p. 20.

finely scabrous, upper surface clothed with short, inconspicuous though rather dense black pile, second and third tarsal segments slightly prolonged beneath and lobed; length 11-12 mm. Central Calif., chiefly Sierra............. *aterrimus* Fall

Bicolored species, dull black with yellow or red markings...... 34

34. Head entirely black, hind angles of prothorax and basal margin and lunate patches on elytral humeri orange red; front triangularly impressed, the clypeal margin thick and reflexed; antennæ reaching beyond hind angles of prothorax, second segment small, third slightly longer than fourth, third to ninth distinctly serrate; prothorax longer than broad, punctures of head and pronotum rather coarse and surface clothed with long fulvous pile, pronotum canaliculate at middle, hind angles broad, slightly prolonged and somewhat divergent, carinæ sharp and fine, diverging slightly from margin, elytra finely striato-punctate, intervals convex, finely punctured and scabrous; second and third tarsal segments distinctly prolonged beneath and lobed; length 12-14 mm. Eastern States.......................... *scapularis* (Say)

Head with frontal area red, pronotum also red except for broad irregular basal area and sometimes hind angles; antennæ not reaching beyond hind angles of prothorax, second segment small, third almost equal to fourth and serrate like following; prothorax longer than broad, rather coarsely, shallowly punctured, sparsely clothed with cinereous pubescence, hind angles broad and sharp, carinæ sharp and divergent from sides, elytra striato-punctate, intervals finely scabrous, second and third tarsal segments but slightly prolonged beneath and lobed; length 13 mm. Ga., Kans.. .... *equestris* (Lec.)

35. Upper surface black, more or less ornamented with red or yellow, head and pronotum densely punctured.................. 36

Upper surface unicolorous, black or brown, punctures of pronotum always well separated on disk.................... 37

36. Rather short and compact species, black or somewhat piceous and dull, basal margin of elytra and epipleuræ flavous, antennæ and legs slightly rufous; antennæ extending slightly beyond hind angles of prothorax, intermediate segments distinctly but not markedly serrate; prothorax but slightly longer than broad, hind angles short and hardly divergent, carinæ fine and close to side margin, elytra distinctly striato-punctate, intervals flattened and finely punctured and rugose, third segments of tarsi alone slightly prolonged beneath and lobed; length 6-9 mm. Sierra and Mts. of northern Calif.. *limbatus* Lec.

Somewhat larger species, black and shining with frontal excavation of head and basal margin of elytra rufous; second antennal segment small, third elongate and triangular; prothorax longer than broad, pronotum densely, coarsely and umbilicately punctured, hind angles short, carinæ close to side margin, elytra with striæ profoundly punctured, intervals convex and sparsely punctured; length 12.5 mm. Mont. .... *orophilus* Harr

37. Prothorax distinctly longer than broad, sides quite straight and convergent forwards from hind angles in males, more parallel or arcuate at middle in females........................ 38

Prothorax hardly longer than broad, sides sinuate in front of hind angles, thence quite straight and parallel or convergent forwards from hind angles with hind angles distinctly divergent in males, more arcuate at middle and narrowed in front in females; male antennæ long and with outer segments quite parallel sided; second tarsal segment hardly, third slightly prolonged beneath and lobed.......................... 39

38. Reddish brown, legs generally flavous, pronotum but moderately coarsely yet densely punctured, slightly canaliculate at middle posteriorly, elytra gradually arcuately narrowed from about middle to apex, distinctly striato-punctate, the intervals finely punctured and slightly rugose, second and third tarsal segments both distinctly prolonged and lobed beneath; length 11-15 mm. Northeastern and eastern States .... *cucullatus* (Say)

Black or dark brown, legs somewhat lighter, pronotum but modarately coarsely and closely punctured on disk, more coarsely, closely and umbilicately at sides, canaliculation at middle quite vague, elytra with sides moderately arcuate at middle, rounded from posterior third to apex, disk rather strongly striato-punctate, intervals flat or convex, finely punctured and rugose, second tarsal segment hardly, third slightly, prolonged beneath and lobed; length 10-14 mm. The typical black phase (*nigropilis*), B. C. south to middle Calif., the brown phase (*nugalis*), middle and southern Calif. .... *nigropilis* Mots.

Similar to above but somewhat smaller and with oval polished unpunctate area on each side of the median line of pronotum; length 9.5 mm. Tacoma, Wash.................... *speculifer* Fall

39. Rufous or rufopiceous, often with suture of elytra flavous, legs rufotestaceous, pronotal punctures somewhat fine and but moderately close on disk, coarser and umbilicate at sides, canaliculation evident at middle posteriorly, elytra finely striato-punctate, intervals flattened, finely punctured and vaguely scabrous; length 11-14 mm. Southern Ariz. and N. M.. *arizonicus* n. sp.

Rufopiceous, often suture and margins of elytra as well as legs and underside quite rufous, disk quite flattened in male, moderately coarsely not closely punctured, a bit closer at sides, but faintly canaliculate at middle at most, elytra distinctly striato-punctate, the intervals slightly convex and finely punctured; length 12-14 mm. Sierra Nevada Mts. of Calif. . . . . *rectithorax* Reitt.

40. Species in great part black or nigropiceous 41

Species in great part brown or brownish castaneous 42

41. Coal black above, faintly shining, legs rufocastaneous, head triangularly depressed in front, clypeal margin prominent and horizontal, head and pronotum coarsely, very closely and umbilicately punctured; antennæ reaching hind angles of prothorax, second and third segments small, equal in length and together as long as fourth, median segments strongly serrate; prothorax longer than broad, sides quite straight and strongly convergent forwards from hind angles, hind angles broad, prominent, the sides markedly reflexed, the carinæ sharp, disk with distinct canaliculation at middle, elytra finely striato-punctate, the intervals flattened, finely punctured and coarsely scabrous, second tarsal segment hardly prolonged beneath, the third distinctly so and lobed; length 12 mm. Marquette, Mich . . . . *erebus* n. sp.

Piceous, base of prothorax, basal segments of antennæ and feet testaceous; prothorax elongate, slightly convex, disk densely punctured and canaliculate at middle, hind angles rounded and inflexed, carinæ oblique and distinct, elytra striato-punctate, intervals flat, finely rugosely punctured, tarsal lobes not conspicuous; length 12 mm. Penn. and southeastern States . . . . *posticus* (Melsh.)

42. Piceous brown above, underside, antennæ, legs and sometimes suture and margin of elytra castaneous; head rather coarsely punctured with front broadly, deeply impressed, clypeal margin narrow, not reflexed, antennæ extending slightly beyond hind angles of prothorax, median segments but little dilated; prothorax not longer than broad, hind angles subacute and slightly divergent, carinæ fine and short, poorly defined, disk finely, rather sparsely punctured; elytra finely striato-punctate, intervals flat and finely punctured, second tarsal segment but slightly prolonged beneath, third distinctly so and evidently lobed; length 10 mm. Rocky Mts. of Colo . . . . *simplex* Lec.

Piceous brown or rufous, elongate, head triangularly impressed in front, clypeal margin arcuate and but little reflexed, coarsely, closely punctured; antennæ reaching hind angles of prothorax in female, distinctly longer in male; prothorax longer than broad, hind angles broad and short, not divergent and with carinæ fine and close to margins, disk finely, not densely punctured, elytra finely striato-punctate, intervals flattened, finely punctured and rugulose, third tarsal segment alone evidently prolonged and lobed beneath; average length 11-14 mm. though sometimes 18 mm. Sierra Nevada Mts. of Calif. . . . . *falli* Reitt.

Athous rufifrons (Randall)

There are three well marked color phases of this species: the true *rufifrons* (Rand.), a rather large piceous species with the clypeus, broad margins to prothorax and a broad vitta on each elytron rufous or rufotestaceous; *reflexus* Lec., a variety, large like the preceding but more or less uniformly piceous in color; and *lengi* Dury, a smaller variety, in reality a geographical race or subspecies, with sides of prothorax quite parallel, the clypeus and margins of prothorax rufotestaceous and a broad vitta on each elytron testaceous. *Athous rufifrons* (Rand.) in its typical phase is limited to eastern Canada and the northeastern States; *reflexus* Lec. most common in the Lake States; and *lengi* Dury confined to the southern Alleghenies, the specimens so far found being from the Black Mountains of North Carolina.

Athous appalachius Van Dyke, new species

Elongate, subparallel, somewhat flattened, rufotestaceous, head above piceous, very sparsely clothed with fine white pile. Head deeply, triangularly impressed in front, clypeal margin prominent, eyes large, front distinctly but not closely punctured; antennæ long and filiform, reaching four segments beyond hind angles of prothorax, second segment small, but little longer than broad, third almost twice as long, somewhat triangular and about three-fourths length of fourth, fourth to eleventh two to three times as long as broad, with sides parallel. Prothorax slightly longer than broad, apex distinctly arcuate, base broadly emarginate, basal margin elevated, sides straight and parallel, apical angles but slightly developed, basal angles hardly divergent, blunt and arcuate posteriorly, and without carinæ, lateral margin broad and flattened, sinuous when viewed laterally; the disk slightly convex, rather finely, somewhat closely punctured, and without canaliculation at middle. Scutellum cordate, flattened and sparsely punctate. Elytra broader than prothorax, at least four times as long, with sides quite parallel; the disk slightly convex, distinctly striate and quite coarsely, closely punctured, with intervals somewhat convex and rugulose, the punctation not evident. Beneath finely, sparsely punctured. Legs long and delicate, tarsi long, the three intermediate tarsal segments of all legs slightly prolonged beneath and lobed. Length 11 mm., breadth 3 mm.

Holotype: No. 3147, Mus. Calif. Acad. Sci., and *Paratype,* presumably males, collected by myself on **Mt. Mitchell, North Carolina,** during July 1902.

This species in color and general form suggests the more usual phase of *rufiventris* Esch., called *ferruginosus* Esch., but differs by having the sides of the prothorax straight and parallel and the punctures of the disk rather fine, not at all umbilicate.

Athous vittiger LeConte

This well known species which ranges along the Pacific Coast from British Columbia to San Francisco Bay, like *rufifrons* (Rand.), also varies in color. The normal phase is rufotestaceous with a median pronotal black vitta, a common sutural and lateral black vitta on each elytron. These darker markings often become so vague as to be hardly discernible or may entirely disappear so that we may have, particularly in females, individuals with unicolorous elytra or individuals that are entirely unicolorous. These latter are also often much larger than normal specimens.

Athous excavatus (Motschulsky)

Athous excavatus (Mots.) is likewise a Pacific Coast species but it has a greater range than the preceding and varies more in color. The typical phase is rufotestaceous with disk of pronotum black, and extends from northern Washington to Santa Cruz Co., Calif. It is fairly constant in coloration except for the fact that in many females the black pronotal marking disappears leaving them unicolorous and somewhat resembling the unicolorous phase of *vittiger* Lec. They are however. always much longer, with sparser pronotal punctation and larger tarsal lobes. On the Carmel peninsula of Monterey Co., a rather dark phase, a piceous brown subspecies with the pronotal disk black and the elytra reddish brown, appears. This contrasts quite markedly with the typical phase and seems to rather abruptly replace it. This phase, I am calling the subspecies **carmeli** and am designating a holotype (No. 3148, Mus. Calif. Acad. Sci.) and several specimens as paratypes from a series collected at **Carmel, Monterey Co., Calif.**, May 16, 1909. In Santa Barbara County, there is a second subspecies. This is *axillaris* Horn and like *carmeli* is in the main piceous brown but with the head, sides of prothorax, a short vitta extending backwards from the humeri and lateral margins of the elytra rufotestaceous. With this I am also associating a more attractive phase from the middle Sierras, my specimens from Tuolumne Co., which differ only in having the basal color a deep black and the contrasting markings more red. In Los Angeles Co. and the mountains of San Bernardino and Riverside Counties, another subspecies appears. This is black with the head and margins of prothorax alone rufotestaceous or even a clear red. This subspecies, I am calling **angelicus** and likewise selecting several specimens to stand as a holotype (No. 3149, Mus. Calif. Acad. Sci.) and paratypes from my **Los Angeles** series.

Athous carolinus Van Dyke, new species

Elongate, narrow, depressed, testaceous, back of head and disk of pronotum somewhat piceous, sparsely clothed with short cinereous pile. Head broadly, triangularly depressed in front, clypeus porrect, prominent and with anterior margin transverse, front rather finely, somewhat sparsely punctured, eyes prominent; antennæ long, filiform, extending several segments beyond hind angles of prothorax, second segment small, slightly longer than broad, third almost twice as long as second and three-fourths length of fourth, the following segments about three times as long as broad, with parallel sides Prothorax longer than broad, slightly narrower anteriorly, apex slightly arcuate, base emarginate, sides almost straight in male, somewhat arcuate at middle in female, the anterior angles not prominent, hind angles broad, blunt, somewhat divergent and extending backwards for a short distance, margin fine, disk slightly convex, shining, vaguely canaliculate at middle, finely, evenly and rather sparsely punctured. Scutellum somewhat companulate, flat, shining and finely, sparsely punctured. Elytra broader than prothorax, somewhat more than three times as long, sides but slightly arcuate, disk with striæ moderately impressed, coarsely punctured, the transverse rugæ between punctures deepening and broadening the depressions, the intervals hardly convex, the general surface sculpturing much as in *acanthus* (Say). Beneath rather finely, somewhat closely punctured on propleuræ, more sparsely elsewhere. Legs delicate, tarsi long, second and third segments distinctly prolonged beneath and lobed, the fourth small and linear. Length 8 mm., breadth 2.25 mm.

Female somewhat larger, 9 mm. in length, more robust, with antennæ shorter, and sides of prothorax arcuate.

Holotype: Male, No. 3150; and *Allotype:* Female, No. 3151, Mus. Calif. Acad. Sci., collected on the summit of the **Black Mountains of North Carolina,** June 1912, by Wm. Beutenmueller, and one *Paratype* from Mt. Mitchell, North Carolina, collected in June 1902, by myself.

This species is in general slightly larger than *Athous acanthus* (Say) but is of the same facies and type of sculpturing. It differs in coloration, in having the prothorax less narrowed in front and the anterior prothoracic angles not prominent or dentate as they are in the greater number of *acanthus*. It is also closely related to *excavatus* Mots., but smaller with the punctures in general, both of prothorax and elytra, finer.

Athous acanthus (Say)

Athous acanthus (Say) varies much in the same way that *excavatus* does. The typical form is piceous, with or without testaceous legs; the weak variety *flavangularis* Horn, has the hind angles of the prothorax yellower than usual; and the well marked subspecies *maculicollis* Lec., is darker, black, with the margins of the prothorax and legs rufotestaceous, sometimes with the clypeus also rufous. This form is also generally somewhat smaller than the typical form and more northern in distribution. West of the Alleghenies as in Ohio and Kentucky, we also find a tendency for this species to become paler as a whole. This last variety quite closely resembles *carolinus.*

Athous pallidipennis Mannerheim

This is one of the most variable of our species both as to color and sculpture. In most places where found it is truly dichromatic, there being a dark phase, piceous or black, and a light phase, black with orange red elytra and generally with the basal angles of prothorax and legs of the same color. In some localities the two phases will be found together, in others separately. In southeastern Alaska, western British Columbia, Washington, Oregon, and northwestern California, comprising the humid coastal area, the typical form is found. In this, the head and pronotum are rather finely, somewhat closely punctured, the elytra but moderately deeply striate and the intervals but slightly convex. The phase described by Mannerheim was of course the lighter one, piceous with orange red elytra, but the darker phase, all black or piceous with suture and side margins of elytra pale is by far the commoner one, at least on the mainland. In this territory intermediate color phases are also quite commonly met with. East of the Cascade mountains as at Pullman, Washington, the species tends to become more truly dichromatic and to have the pronotal punctation finer and the elytral striation and punctation also much finer and the intervals flatter. In the mountains of northern California and the Sierra Nevada, the species becomes much larger, more robust, with the punctation of head and pronotum coarser and closer, and the elytra more convex with the striæ deeply impressed and coarsely punctured, and the intervals quite convex. In the northern part of the state there is a tendency for the dark phase which is coal black, to dominate but in the middle Sierras, the lighter phase seems to be the more common.. This robust phase, both light and dark, has such a distinctive appearance that I propose to list it as a subspecies, describing it as follows:

Athous pallidipennis sierræ Van Dyke, new subspecies

Similar in general structural peculiarities to the typical form but differing by being larger, more convex and generally more robust, the antennæ heavier and with segments 2-6 quite serrate (almost filiform in typical form), the head and pronotum densely, coarsely, cribrately punctured and subopaque, the elytra deeply striate, the striæ coarsely punctured, the intervals very convex and distinctly punctured and somewhat rugose; color black with hind angles and basal margin of prothorax, elytra, hind margins of ventral segments, and antennæ and legs in male (in female rufopiceous) reddish orange. Male, length 12 mm., breadth 3.75 mm.; female, length 14 mm., breadth 4.5 mm.

Holotype: Male, No. 3152; and *Allotype:* Female, No. 3153, Mus. Calif. Acad. Sci., and several designated *Paratypes* from a series of twenty specimens collected by myself at **Yosemite Valley, Calif.**, June 3 and 10, 1921. I also have good series of the light phase of *sierræ* from numerous other localities in the Sierras and mountains of northern California as well as a series of over seventy specimens of the all black phase of the same subspecies. My entire series of all phases of the species is close to two hundred specimens.

Athous scissus LeConte

This large and shining black species is one of the most characteristic species of the heavily timbered areas of the Pacific Coast. It is generally found beneath the bark of old rotting stumps. The typical form ranges from western British Columbia south along the coast to the Russian River in California. In the mountains of northern California and the Sierra Nevadas, it is also to be found but here there is a tendency at times for the elytral carinæ to appear at the hind angles of the prothorax. Specimens of this kind were described by Fall as *ingens*. This is, however, not a well marked form but rather an individual peculiarity, not entitled, therefore, to even subspecific rank. Indistinct carinæ near the hind angles are to be met with as often in specimens from the coastal area as in those from the mountains.

Athous rufiventris (Eschscholtz)

As stated elsewhere,[23] I have combined this species with *ferruginosus* Esch. In the typical *rufiventris,* of which I have two specimens collected by myself from the type locality, Unalaska, the head and prothorax are almost entirely black, the underside in front piceous, the abdomen somewhat rufous, elsewhere rufotestaceous. In typical *ferruginosus,* the insect is entirely ferruginous or rufotestaceous, but the species is as a whole very variable and specimens similar to typical *rufiventris* are commonly to be met with in company with typical *ferruginosus.* Some of the large females also often have well defined though fine carinæ near the hind angles. This common species ranges from Unalaska Island south along the Pacific Coast to the San Francisco Bay region. Throughout most of this area the dominant color is ferruginous but along the immediate coast from Newport, Ore., to Humboldt Bay in California, is a region of extreme humidity where a melanotic phase is to be found. This is so definite a geographical race and contrasts so markedly with the usual color phases that I propose to give it a subspecific name calling it:

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[23] The Coleoptera Collected by the Katmai Exped., by Edwin C. Van Dyke, Tech. Papers, Nat. Geog. Soc., Wash., 1924, p. 20.

Athous rufiventris maritimus Van Dyke, new subspecies

It resembles the lighter and more typical phases in every physical regard, only differing in color, being black or piceous with antennæ, legs and elytra somewhat lighter.

Holotype: Male, No. 3154; and *Allotype:* Female, No. 3155, Mus. Calif. Acad. Sci., and several designated *Paratypes* from **Humboldt Co., Calif.,** collected presumably near Eureka, by myself, during June 1901. In my series of over twenty individuals are specimens from Newport, Waldport and Marshfield, Oregon, as well as from several places in Humboldt Co., Calif. It resembles in color and general appearance *Athous cribratus* Lec., but differs in the main by having deeper and more coarsely punctured elytral striæ.

Athous imitans Fall

This species as indicated in the table is very variable as to both size and color. It is fairly common in places throughout the mountains of northern California and is to be found as far north as Nanaimo, B. C. Its flattened or subsulcate head, not prominent clypeal margin and coarsely, very closely and somewhat aciculately punctured prothorax, with broad, short hind angles, would place it in association with *agriotoides, brevis* and *sordidus,* species which have a facies quite suggestive of *Limonius ornatulus* Lec. and its associates.

Athous brevis Van Dyke, new species

Small, short and moderately robust, somewhat flattened, black, elytra brown, narrow basal margin of prothorax and elytra luteous, epipleuræ, outer parts of legs and base of antennæ rufous. Head flattened, clypeus porrect and moderately prominent, anterior margin transverse, front coarsely, closely punctured; antennæ reaching hind angles of prothorax, second and third segments about equal in length, twice as long as broad, and almost equal to fourth, median segments somewhat longer than broad and distinctly triangular. Prothorax as broad or broader than long, apex almost truncate, base emarginate, sides slightly arcuate, almost subparallel, suddenly constricted near apex, hind angles broad and hardly extended, disk coarsely, closely, evenly and somewhat aciculately punctured. Elytra twice as long as prothorax, slightly broader at base, sides subparallel and evenly rounded at apex, disk somewhat flattened, striæ distinctly impressed, rather coarsely punctured anteriorly, finer posteriorly, intervals flattened, distinctly but somewhat irregularly punctured and faintly rugulose, entire upper surface rather finely, sparsely pubescent. Beneath, prosternum coarsely and not closely punctured, propleuræ coarsely and closely and afterbody finely and sparsely punctured. Legs short, second and third tarsal segments evidently extended beneath and slightly lobed, fourth segment small but quite evident. Length 7 mm., breadth 1.75 mm.

Holotype: Male, No. 3156; and *Allotype:* Female, No. 3157, Mus. Calif. Acad. Sci., and several designated *Paratypes,* collected by myself from the slopes of **Mt. Tamalpais, Marin Co., Calif.**, May 20 and 23, 1909. My series consists of thirty-five specimens and is from the following localities in California: Siskiyou Co., June, Nunenmacher; Carrville, Trinity Co., June, Van Dyke; Plumas Co., June, Nunenmacher; Glen Alpine, Eldorado Co., June, Van Dyke; Placer Co., Napa Co., Marin Co., Ben Lomond, Santa Cruz Co., and Fresno Co. They are fairly constant as to color and general characteristics.

This short, little species of the brushy or chaparral areas of California looks much like several of the smaller species of *Limonius* especially some of the more sombre phases of *ornatulus* and *maculicollis* though it is a bit larger. It is rather closely related to *Athous sordidus* n. sp. and also belongs near *agriotoides* Fall and *imitans* Fall.

Athous sordidus Van Dyke, new species

Rather small, moderately robust, somewhat flattened; brown with a slight rufous tinge, antennæ, mouthparts, epipleuræ and legs quite rufous; slightly shining above and rather sparsely clothed above with conspicuous, rather long, gray pile. Head somewhat flattened, transversely impressed near clypeus, clypeus porrect with margin distinct, somewhat depressed at middle and slightly emarginate, front coarsely, closely punctured; antennæ reaching about one segment beyond hind angles of prothorax, second and third segments about twice as long as broad, equal in length, and each two-thirds length of fourth, median segments distinctly longer than broad, apex faintly lobed at middle, base emarginate, sides subparallel behind, gradually arcuately narrowing in front, front angles projecting forwards, hind angles short and broad, disk convex, rather coarsely, closely and somewhat aciculately punctured, median canaliculation not evident, scútellum elongate, flattened and sparsely punctured. Elytra slightly broader than prothorax, almost three times as long, sides subparallel in front, gradually arcuate behind to apex, disk somewhat flattened, striæ fine but distinct, finely punctate with elongate punctures, intervals flattened, rather coarsely, somewhat biseriately punctured, the punctures conspicuous and almost as large as those of the striæ. Beneath with prosternum moderately coarsely, rather sparsely punctured, propleuræ more closely and afterbody more finely and but moderately closely punctured. Legs rather short, second and third tarsal segments prolonged beneath and slightly lobed, fourth segment small but evident. Length 8 mm., breadth 2 mm.

Holotype: No. 3158, Mus. Calif. Acad. Sci., a unique in my collection, collected many years ago in **Los Angeles Co., Calif.,** probably in the hills.

This species is evidently related to *brevis,* replacing it in southern California. It is larger, more elongate, with longer prothorax, longer antennæ, coarser punctation on elytral intervals, and with much longer pubescence.

Athous rufipennis Van Dyke, new species

Rather small and short, head and prothorax nigropiceous, elytra rufocastaneous, beneath piceous, antennæ and legs rufopiceous, shining above and with a somewhat greasy aspect, the pubescence fine and sparse. Head broadly flattened in front, clypeal margin arcuate but clypeus not sharply demarked from front, front coarsely and rather closely punctured; eyes moderate in size; antennæ short, not reaching hind angles of prothorax, second segment a little longer than broad, third slightly longer and about two-thirds length of fourth, fourth longest, the following one and a half to two times as long as broad and but slightly enlarged distally. Prothorax over a third longer than broad, apex at middle faintly arcuate, base emarginate, sides moderately arcuate at middle, anterior angles not prominent, hind angles short, non-divergent and non-carinate, disk very convex, coarsely and somewhat closely and evenly punctured, not canaliculate at middle. Scutellum cordate, finely cristate at middle and rather coarsely punctured. Elytra but little broader than prothorax and two and a half times as long, slightly arcuate at sides and broader behind the middle, disk convex, striæ fine and finely punctured, the intervals almost flat and finely, irregularly biseriately punctured. Beneath rather coarsely, closely (umbilicately on propleuræ) punctured in front, more finely and sparsely behind. Legs rather short, tarsi with three intermediate segments but little prolonged and lobed beneath. Length 7.5 mm., breadth 2.25 mm.

Holotype: No. 3159, Mus. Calif. Acad. Sci., a unique and probably a female, collected at **Dutch Flat, Placer Co., Calif.**, June 16, 1914.

This chubby little species suggests by its size, general shape, and color, some of the phases of *imitans* Fall or even some of the smaller species of *Ludius (Corymbites)* like *angularis* (Lec.). Its characters are, however, definite and should enable it to be recognized should anyone be so fortunate as to collect it.

Athous essigi Van Dyke, new species

Elongate, somewhat depressed, narrowed in front and behind, head and prothorax black, elytra rufous, antennæ and outer portions of legs rufopiceous, underside of body nigropiceous, surface clothed with fine, short and rather sparsely placed pile. Head deeply, broadly sulcate in front, clypeal margin broadly rounded in front and well defined but not elevated, front coarsely, quite closely punctured; antennæ long, reaching at least two segments beyond hind angles of prothorax, second segment small, hardly longer than broad, third slightly longer, the two just perceptibly longer than fourth, median segments at least twice as long as broad and serrate. Prothorax almost a third longer than broad, anterior margin subtruncate, barely emarginate, sides sinuate in front of hind angles, thence almost straight and slightly converging to near front angles where rounded, front angles not prominent, hind angles prominent, triangular and somewhat divergent, disk coarsely, rather closely and evenly punctured, median canaliculation but vaguely indicated. Scutellum elongate, with vague longitudinal crista at middle and slightly punctured.

Elytra almost three times as long as prothorax, distinctly broader than the latter, sides slightly arcuate at middle, gradually narrowed from posterior third to apex, disk finely but sharply striate, the striæ finely punctured with elongate punctures, the intervals slightly convex, finely punctured and finely rugulose. Beneath with prosternum rather coarsely, not closely punctured, propleuræ more coarsely, the punctures umbilicate, and afterbody very finely, rather closely punctured, prosternal spine long and acute and finely sulcate. Legs long, second tarsal segment almost cylindrical, third but slightly prolonged beneath and lobed, and fourth small and just barely prolonged backwards. Length 11.5 mm., breadth 3.25 mm.

Holotype: No. 3160, Mus. Calif. Acad. Sci., and *Paratype* in my collection, the first collected by my associate Prof. E. O. Essig, at **Placerville, Calif.**, and kindly presented to me, the latter collected at Dutch Flat, Placer Co., Calif., June 15, 1915. A large series of specimens was collected this last summer at Forest Hill, Placer Co., June 1931, and at Riverton, Eldorado Co., during July.

This species has physical characters which place it well apart from others, but in color, size and superficial appearance it somewhat resembles the more typical light phases of *pallidipennis.* Its sharply defined and depressed clypeus, thick and elevated in *pallidipennis,* short third segment of antennæ and type of tarsi, will, however, always readily distinguish it.

Athous polygenus (Fall)

This peculiar species is quite variable. It was placed by Fall in the genus *Corymbites* or *Ludius* as it is now called. The type was, however, one of the smaller, somewhat depauperized and atypical forms, which had the clypeal margin not only depressed at the middle but slightly interrupted there. In fully developed specimens, the clypeus is somewhat depressed for the front is always quite broadly and deeply sulcate, but it is complete and sharply defined. The tarsi are also those of *Athous* for though the lobes of the intermediate segments are not very prominent they are evident, besides the long first and very small fourth segments are characteristic of the genus.

Athous opilinus Candeze and **Athous ornatipennis** (LeConte)

The first species, a small and attractive one, was described as from Ohio. It seems to be very scarce there for but few Ohio specimens are represented in collections. In California it is more often found, sometimes quite commonly as in the Sequoia National Park. I have carefully compared a specimen from the type locality with California specimens and find them absolutely the same. A rather close relative of this is *Athous ornatipennis* (Lec.), a species which is of the same size and has a similar color pattern. This latter differs mainly in having the tarsi without well defined lobes. It was formerly placed with *Limonius* but the single prosternal suture and long first and short fourth tarsal segments will, as stated before, clearly place it with *Athous*.

Athous undulatus (De Geer)

This is a well known boreal species found in the more northern parts of Europe and Asia as well as North America. American specimens are, however, very rare in collections. My single representative was collected by Mr. John D. Sherman Jr., in the Lake Superior region. The genus *Harminius* Fairm. erected for the reception of this and a limited number of associated species is not worthy of being considered as of more than subgeneric value at the most. The dominating characters of *undulatus* are those of *Athous*. The characters selected for *Harminius* are merely such as would assist in separating it from some of the more typical *Athous*.

Athous triundulatus Mannerheim

This species is closely related to the preceding but much smaller though quite distinct. As far as known, there are but two specimens in existence, the type presumably in Moscow, and a single specimen collected by the members of the Katmai Expedition to Alaska and now in the collection of the Ohio State University.

Athous cucullatus (Say)

With the above, I have placed *fossularis* Lec. The latter is nothing more than a large and robust female, as I have proved by comparing several typical female specimens with the type.

Athous nigripilis Motschulsky

This species is widely distributed throughout the Pacific region, extending as far east in the north as Alberta. It varies somewhat in size, size of punctures and degree of convexity as regards the elytral intervals. The black or northern phase could only be confused with black phases of *pallidipennis* but the dense pronotal punctures of the latter and long cinereous pile should readily separate it. In southern California, *nugalis* Fall replaces it to a great extent. This I consider as but a subspecies at the most, as it only differs in color and in general by being slightly larger. It also definitely intergrades with the more typical northern phase. *Athous speculifer* Fall I am also inclined to consider as but an atypical specimen but am leaving it as distinct until we can get more evidence.

Athous arizonicus Van Dyke, new species

Elongate, narrowed in front and behind, rufotestaceous, antennæ, legs and underside lighter or more rufous. Head coarsely, closely punctured, front deeply, triangularly impressed, clypeus thick and reflexed; antennæ reaching hind angles of prothorax in female, extending two segments beyond in male, second segment small, third very long, longer than fourth, segments 3-5 in male broad and triangular, the following very elongate and with sides almost parallel, segments 3-10 in female all somewhat triangular. Prothorax but slightly longer than broad, with sides straight and convergent forward from hind angles or somewhat sinuate in front of hind angles and more parallel forwards in male, more arcuate in female, hind angles broad, somewhat extended and slightly divergent, the carinæ fine, long and close to margin, disk moderately coarsely and densely punctured, a slight median canaliculation near base. Elytra almost three times as long as prothorax, very finely striatopunctate in male, more coarsely in female, the intervals flattened in male or slightly convex in female and finely punctured, the general surface dull and clothed with sparse, short, suberect pile. Beneath quite coarsely, closely punctured in front and very finely, closely behind, the legs long, tarsi with second segment hardly prolonged beneath, third distinctly prolonged and lobed, and fourth but little shorter than third and subcylindrical. Male, length 13 mm., breadth 3.5 mm., female, length 14 mm., breadth 4 mm.

Holotype: Male, No. 3161; and *Allotype:* Female, No. 3162, Mus. Calif. Acad. Sci., and several designated *Paratypes* in my collection, collected in the **Chiricahua Mts.** of southern **Arizona,** in June 1908, by Mr. Virgil Owen. I have also designated several paratypes among the material submitted to me for study by the American Museum of Natural History. I have examined specimens from several other localities in Arizona as the Huachuca Mts., as well as the Jemez Mts., and Fort Wingate, New Mexico.

This species somewhat resembles both *cucullatus* and *rectithorax,* being separated from the former by its much less dense pronotal punctation and flatter disk in male, the less development of the lobes of the tarsal segments as well as by its somewhat greasy appearance; and from the latter, by its longer prothorax, denser pronotal punctures, less suddenly divergent hind angles of prothorax, finer elytral striation and less shining appearance. It also appears to be quite different from any of the described Mexican species.

Athous erebus Van Dyke, new species

Robust, coal black above, legs rufotestaceous, faintly shining and sparsely clothed with short, very fine gray pile. Head coarsely, closely and umbilicately punctured, front triangularly impressed, clypeus horizontal and prominent; antennæ robust, reaching hind angles of prothorax, second and third segments small, of about equal length and together as long as fourth segment, fourth longer than fifth, intermediate segments all elongate and strongly serrate. Prothorax distinctly longer than broad, sides straight and convergent from apices of hind angles to near apex, side margins broad and reflexed, front angles not prominent, hind angles very broad and auriculate, the sides greatly reflexed, carinæ fine, long, sinuately diverging from margins; disk moderately convex, coarsely, densely and umbilicately punctured, median canaliculation fine but complete. Scutellum closely punctured and with pit at center. Elytra somewhat more than twice as long as prothorax, subparallel at sides and evenly rounded apically, disk moderately convex, striæ deeply impressed and finely punctured, intervals flattened, finely punctured and evidently scabrous. Beneath coarsely and densely punctured in front and very finely, rather closely behind, second tarsal segment hardly prolonged beneath, the third evidently prolonged and lobed, the fourth short but subcylindrical. Length 12 mm., breadth 3.5 mm.

Holotype: No. 3163, Mus. Calif. Acad. Sci., a unique in my collection, collected at **Marquette, Mich.**, June 29, by Mr. John D. Sherman, Jr.

This interesting species in size and robustness somewhat suggests *scapularis,* a black phase of which I at first thought it to be, but it differs markedly as regards the antennæ, tarsi and minuter sculpturing and has an entirely different color pattern as well as type of pubescence.

BIBLIOGRAPHY

Athous rufifrons (Rand.) (Elater), Boston Jour. Nat. Hist., II, 1838, p. 6.

Athous rufifrons var. reflexus Lec., Tr. Am. Phil. Soc., X, 1853, p. 427; Cand., Mon. Elat., III, 1860, p. 474; Blatchley, Col. Ind., 1910, p. 761.

Athous rufifrons subsp. lengi Dury, Ent. News, XXII, 1911, p. 275; Leng, Cat. Col., 1920, p. 168.

Athous appalachius n. sp.

Athous vittiger Lec., Tr. Am. Phil. Soc., X, 1853, p. 427; Cand., Mon. Elat., III, 1860, p. 486.

Athous brightwelli (Kirby) (Pedetes), Fauna Bor. Am., IV, 1837, p. 146; Lec., Tr. Am. Phil. Soc., X, 1853, p. 425; Blatchley, Col. Ind., 1910, p. 759.

oblongicollis Melsh., Proc. Acad. Nat. Sci. Phila., II, 1846, p. 155.

articollis Melsh., Proc. Acad. Nat. Sci. Phila., II, 1846, p. 156.

affinis Cowper, Tr. Lit. and Hist., Soc. Quebec, 1865, p. 61.

Athous excavatus (Mots.) (Pedetes), Bull. Mosc., IV, 1859, p. 367, Cand., Cat. Method. Elat., 1891, p. 156.

Athous excavatus carmeli n. subsp.

Athous excavatus axillaris Horn, Tr. Am. Ent. Soc., III, 1871, p. 316.

Athous excavatus angelicus n. subsp.

Athous carolinus n. sp.

Athous acanthus (Say) (Elater), Tr. Am. Phil. Soc., VI, 1839, p. 178; (Pedetes), Lec., Tr. Am. Phil. Soc., X, 1853, p. 425; (Athous), Blatchley, Col. Ind., 1910, p. 760.

mendicus Dej., Cat., ed. 3, 1837, p. 102.

Athous acanthus var. flavangularis Horn, Tr. Am. Ent. Soc., III, 1871, p. 317.

Athous acanthus sub sp. maculicollis Lec., Smiths. Misc. Coll., VI, No. 167, 1863, p. 85.

Athous pallidipennis Mann., Bull. Mosc., XVI, 1843, p. 244.

Acanthus pallidipennis sierræ n. subsp.

Athous coquerelli Reitt., Wien Ent. Zeit., XXVII, 1908, p. 36.

||*jejunus* Fall, Tr. Am. Ent. Soc., XXXII, 1907, p. 231.

Athous scissus Lec., Rept. Exp. and Surv. Miss. to Pac., XII, pt. 3, 1857, p. 46; Cand., Mon. Elat., III, 1860, p. 487.

ingens Fall, Tr. Am. Ent. Soc., XXXVI, 1910, p. 131.

Athous rufiventris (Esch.) (Elater), Entomogr., 1822, p. 71; (Athous), Mann., Bull. Mosc., XVI, 1843, p. 245; Cand., Mon. Elat., III, 1860, p. 428; Van Dyke, Col. Katmai Exped., Tech. Pap. Nat. Geog. Soc. Wash., 1924, p. 20.

Athous rufiventris var. ferruginosus Esch., Thon, Ent. Arch. I, ii, 1829, p. 33; Mann., Bull. Mosc., XVI, 1843, p. 244; Cand., Mon. Elat., III, 1860, p. 432.

Athous rufiventris subsp. maritimus n. subsp.

Athous rufotestaceus Fall, Tr. Am. Ent. Soc., XXXIII, 1907, p. 231.

Athous cribratus Lec.. Rep. Col. W. 100th Mer., Ann. Rep. Chf. Eng., App. VV, 1876, p. 516.

Athous agriotoides Fall, Tr. Am. Ent. Soc., XXXIII, 1907, p. 230.

Athous imitans Fall, Tr. Am. Ent. Soc., XXXVI, 1910, p. 131.

Athous brevis n. sp.

Athous sordidus n. sp.

Athous rufipennis n. sp.

Athous opilinus Cand., Mon. Elat., III, 1860, p. 435.

Athous ornatipennis (Lec.) (Limonius), Smiths. Misc. Coll., VI, 1863, p. 84; Leng, Cat. Col., 1920, p. 168; Blatchley, Col. Ind., 1910, p. 757.

Athous palpalis Fall, Tr. Am. Ent. Soc., XXXIII, 1907, p. 229.

Athous essigi n. sp.

Athous polygenus (Fall) (Corymbites), Tr. Am. Ent. Soc., XXXVI, 1910, p. 136.

Athous discrepans Reitt., Wien Ent. Zeit., XXVII, 1908, p. 36.

||*discors* Fall, Tr. Am. Ent. Soc., XXXIII, 1907, p. 230.

March 3, 1932

Athous undulatus (DeGeer) (Elater), Ins., IV, 1774, p. 155; (Athous), Kiesen. Naturg. des Ins. Deutsch., IV, 1861, p. 320; Cand., Mon. Elat., III, 1860, p. 450; Lec., Proc. Acad. Nat. Sci. Phila., 1866, p. 391.

trifasciatus (Herbst) (Elater), Käfer, X, 1806, p. 31, 39, pl. 160, fig. 12; (Athous), Redt., Faun. Austr., ed. 2, 1858, p. 492.

Athous triundulatus Mann., Bull. Mosc., XVI, 1843, p. 222; Cand., Cat. Method. Elat., 1891, p. 157; Van Dyke, Col. Katmai Exp., Tech. Pap. Nat. Geog. Soc. Wash., 1924, p. 20.

Athous aterrimus Fall, Tr. Am. Ent. Soc., XXXVI, 1910, p. 130.

Athous scapularis (Say) (Elater), Tr. Am. Phil. Soc., VI, 1839, p. 178; (Pedetes) Lec., Tr. Am. Phil. Soc., X, 1853, p. 425; (Athous), Cand., Mon. Elat., III, 1860, p. 429; Blatchley, Col. Ind., 1910, p. 760.

Athous equestris (Lec.) (Pedetes), Tr. Am. Phil. Soc., X, 1853, p. 426; (Athous), Dej., Cat., ed. 3, 1837, p. 101; Cand., Mon. Elat., III, 1860, p. 428.

Athous limbatus Lec., Proc. Acad. Nat. Sci. Phila., 1861, p. 391.

Athous orophilus Har., Gemm. and Harold, Cat. Col., V, 1869, p. 1567.

||*montanus* Lec., Proc. Acad. Nat. Sci. Phila., 1866, p. 391.

Athous nigripilis Mots., Bull. Mosc., XXXII, III, 1859, p. 368; Cand., Cat. Method. Elat., 1891, p. 156.

Athous nigripilis subsp. nugalis Fall, Tr. Am. Ent. Soc., XXXIII, 1907, p. 228.

Athous speculifer Fall, Tr. Am. Ent. Soc., XXXIII, 1907, p. 229.

Athous cucullatus (Say) (Elater), Ann. Lyc. Nat. Hist. N. Y., I, 1825, p. 264; Tr. Am. Phil. Soc., VI, 1836, p. 177; (Pedetes), Lec., Tr. Am. Phil. Soc., X, 1853, p. 425; (Athous), Cand., Mon. Elat., III, 1860, p. 430; Blatchley, Col. Ind., 1910, p. 760.

hypoleucus Melsh., Proc. Acad. Nat. Sci. Phila., II, 1846, p. 155.

procericollis Melsh., Proc. Acad. Nat. Sci. Phila., II, 1846, p. 156.

strigatus Melsh., ♀ Proc. Acad. Nat. Sci. Phila., II, 1846, p. 154.

fossulatus (Lec.) ♀ (Pedetes), Tr. Am. Phil. Soc., X, 1853, p. 426; (Athous), Cand., Cat. Method. Elat., 1891, p. 156.

Athous arizonicus n. sp.

Athous rectithorax Reitt., Wien Ent. Zeit., XXVII, 1908, p. 36.

||*recticollis* Fall, Tr. Am. Ent. Soc., XXXIII, 1907, p. 228.

Athous erebus, n. sp.

Athous posticus (Melsh.) (Limonius), Proc. Acad. Nat. Sci. Phila., II, 1846, p. 158; (Pedetes), Lec., Tr. Am. Phil. Soc., X, 1853, p. 426; (Athous), Cand., Cat. Method. Elat., 1891, p. 156.

Athous simplex Lec., Rep. Col. W. 100th Mer., Ann. Rep. Chf. Eng., App. VV, 1876, p. 516; Cand., Cat. Method. Elat., 1891, p. 156.

Athous falli Reitt., Wien. Ent. Zeit., XXVII, 1908, p. 35.
||*quadricollis* Fall, Tr. Am. Ent. Soc., XXXIII, 1907, p. 229.

Genus **Ludius** Eschscholtz

In using the name *Ludius* Esch. instead of *Corymbites* Latr., I am following Hyslop instead of Schenkling, even though the latter in the Catalogus Coleopterorum, is the latest cataloguer. I also refuse to break up the genus into the numerous illy defined genera that have been used by many of the recent workers in Europe. There the fauna is limited and the species are apparently the remnants or relict terminals of the phylogenetic tree. As such they can more readily be assembled into lesser groups capable of being somewhat defined. In this country, the number of species is large and they show all degrees of divergence from those which are more or less isolated, relict species as in the Old World, to those which are rather recent offshoots from the parent stem. They, therefore, do not readily fall into the groupings which have been adopted in Europe. Too many of them are also annectant species. In this paper I will use but the one genus. Perhaps at a later date, good characters may be found which will enable certain groups to be separated off into genera of lesser size. I am unable to find such characters now.

The genus as here used may be defined as containing those Elateridæ having the front somewhat flattened, the clypeal margin interrupted or absent at the middle, the mouthparts projecting forwards, the mandibles emarginate at apex, the first segment of the antennæ of normal size, no antennal grooves beneath, the prosternal sutures generally single (one small group of four species with double sutures), and not widely separated, the mesosternum declivous and with distinct sutures separating them from metasternum, the posterior coxal plates gradually dilated inwards, the tarsi without lobes beneath and the claws simple. The genus is a large one and very polymorphic, containing narrow elongate species as well as broad and more or less flattened ones, those having antennæ which vary from the filiform through the serrate to the pectinate type, as well as those which show all manner of coloration and degree of pilosity. The antennæ on the whole have been found to be the character most useful for separating the species though even they are variable and must not be completely relied upon.

I have been able to study either the types or carefully determined representatives of all except one of our species and have in my collection specimens of all except two or three of them. Most species are represented by large series which with an extensive field knowledge has enabled me to better estimate their degrees of variation. As a result I have reduced many of those listed to subspecific or varietal rank or even to synonymy. I have also attempted to place some of the unrecognized species described by Mannerheim, Motschulsky and other early workers. The Siberian species, *confluens* Gebler and *sericeus* Gebl., credited to Alaska, the latter listed by Schwarz in the Harriman Report,[24] I have been unable to study so could not incorporate in my table. Many new species discovered within recent years have also been added.

Synoptic Table

1. Elytral striæ always distinct, prosternal spine more or less elongate and horizontal 2

Elytral striæ to a great extent obliterated, at least on disk, prosternal spine short and suddenly curved upwards .... subgenus *Paranomus* 89

2. Antennæ pectinate or markedly and acutely serrate in males ... 3

Antennæ not pectinate and but moderately acutely serrate at most in males 4

3. Male antennæ decidedly pectinate, the appendages long and narrow, head and prothorax bronzed, elytra luteous with elongate black maculations near apex or entirely bronzed with violaceous reflections; length 12-16 mm. Alaska to Alberta, Great Lakes and Maine .... *virens* (Schr.)

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[24] Harriman Alaska Exped., vol. VIII, pt. 1 (1904), p. 181.

Male antennæ not strictly pectinate but very acutely serrate, the appendages not as long as the segments, black, elytra luteous with scutellar and two large maculations on each elytron black; length 8-10 mm. Eastern Canada, Ohio to Mass.....................................*vernalis* (Hentz)

4. Third antennal segment quite similar to following segments, though sometimes a bit shorter or longer than fourth...... 5

Third antennal segment quite unlike the following, either as short as second, slightly longer, or elongate and more or less cylindrical.................................... 39

5. Antennæ with intermediate segments transverse and quite strongly serrate in the males.......................... 6

Antennæ with intermediate segments not transverse and less strongly serrate even in the males...................... 11

6. Pronotum rather deeply sulcate or canaliculate, at least as far forward as middle................................ 7

Pronotum canaliculate only at base or with median smooth line observable.................................... 8

7. Bronzed, irregularly clothed with patches of gray pile, prothorax rather strongly punctured and with prominent and divergent hind angles; length 13-17 mm. Northern Europe and Asia and northeastern America...................*sjaelandicus* (Müller)

Coal black, females much broader and flatter than males, second antennal segment almost as long or as long as third, moderately triangular, median segments broadly triangular, and prolonged backwards beneath, prothorax longer than broad, coarsely, moderately closely punctured in males, very closely in females, hind angles prominent, slightly divergent and with distinct carinæ, elytra distinctly striate, the intervals slightly convex, biseriately punctured in males, more numerously and irregularly punctured in females; length 15-23 mm. Pacific States............................*cribrosus* (Lec.)

8. Pronotum definitely canaliculate towards base............... 9

Pronotum not distinctly canaliculate but with smooth median line.. 10

9. Prothorax margined with red, first antennal segment and legs somewhat rufous, pronotum rather finely, sparsely punctured, third antennal segment distinctly triangular and but two-thirds length of fourth, hind angles of prothorax carinate and divergent, elytra with striæ deep and distinctly punctured, the intervals very convex and finely, biseriately punctured; length 8-11 mm. South Central States........
....................................*signaticollis* (Melsh.)

Black, faintly æneous, prothorax strongly, closely, more or less cribrately punctured, third antennal segment fully as long as fourth or even longer and distinctly triangular, almost as broad at apex as following segment, median segments as broad as long and prolonged beneath, hind angles of prothorax straight or but slightly divergent, strongly carinate, elytra distinctly striate, the striæ finely, rather closely punctured, intervals slightly convex and distinctly, irregularly punctured and finely rugose; length 12-16 mm. Northwestern Calif., B. C. .... *uliginosus* n. sp.

10. Black with black pubescence, third antennal segment smaller than fourth, pronotum densely punctured, hind angles short, divergent and blunt at apex, elytral striæ fine and well impressed, intervals rather densely punctured; length 12 mm. Calif. .... *obscurus* (Lec.)

11. Much elongated and narrow species, third antennal segment almost as long or as long as fourth, intermediate segments fully as long as broad and generally with sides somewhat parallel 12

Species smaller and but moderately elongate and narrow, third antennal segment triangular and quite similar in size and shape to fourth, intermediate segments somewhat serrate but not twice as long as broad 32

12. Narrow and very elongate species, antennæ in males extending several segments behind hind angles of prothorax 13

Species generally larger, flatter, and broader, the antennæ in males shorter, rarely extending more than a segment and a half behind hind angles of prothorax 30

13. Upper surface more or less unicolorous, black or brown 14

Upper surface bicolored, elytra vittate or of contrasting color to head and prothorax 25

14. Surface conspicuously clothed with closely appressed pile producing a pruinose appearance 15

Surface less evidently pilose or quite glabrous 17

15. Pronotum evenly convex from side to side, not flattened laterally, coarsely, densely punctured, distinctly canaliculate; color black, somewhat submetallic; length 13-20 mm. B. C. to Mts. of northern Calif. and Sierra .... *silvaticus* n. sp.

Pronotum convex at middle, flattened or deplanate laterally... 16

16. Flattened or but slightly convex, pronotum rather sparsely punctured at middle, densely at sides, not evidently canaliculate, color black, somewhat submetallic, or testaceous, all antennal segments beyond second at least a third longer than broad, prothorax gradually narrowed forwards from hind angles, elytral intervals but slightly convex, punctured and shining; length 13-20 mm. B. C. to northern Calif. . *protractus* (Lec.)

Distinctly convex, brown with head and prothorax darker, fourth antennal segment but little longer than broad, prothorax less narrowed in front, almost as broad just back of apex as in front of hind angles, elytral intervals convex, punctate-rugose and dull; length 15-16 mm. Central Calif. . . *aplastoides* n. sp.

17. Black or slightly bronzed species, with or without rufous legs. . 18

Brown or reddish brown species. 22

18. Large and shining, coal black species, the pile fine and black, prothorax distinctly narrowed anteriorly and not evidently canaliculate. 19

Moderate sized species, 14 mm. in length or less, upper surface less shining, sparsely clothed with gray hair, prothorax elongate, subparallel in front or spatulate, rather suddenly narrowed near front angles, and distinctly canaliculate. . . . 20

19. Prothorax with sides almost straight and divergent backwards, disk coarsely, sparsely punctured at middle, densely at sides, elytral intervals flat and rather coarsely punctured; length 16-19 mm. (Closely related to *protractus* but coal black, subglabrous and generally more robust.) Northwestern coastal counties of Calif. *anthrax* (Lec.)

Prothorax with sides distinctly arcuate, disk finely and densely punctured throughout, elytral intervals convex and finely, rather densely punctured; length 18-25 mm. (Has the facies of *volitans* but with longer antennæ.) Middle Sierra of Calif. . . . . *atlas* n. sp.

20. Entirely black, pronotum coarsely, densely and evenly punctured, elytral intervals rather finely punctured; length 11-15 mm. Northern Calif. especially near coast. . . . . *dolorosus* n. sp.

Bicolored species. 21

21. Black or slightly bronzed with red legs, pronotum more finely punctured at middle, more coarsely at sides, elytral intervals more coarsely punctured; length 13-15 mm. Northeastern States. . . . . *fulvipes* (Bland)

Plumbeous black, elytra ochraceous yellow, base and underside of first antennal segment, mandibles, labrum and prosternal lobe rufous, anterior angles of prothorax narrowly and obscurely rufescent, hind angles and narrow marginal band and legs rufotestaceous. Similar to preceding except for color and more elongate and parallel-sided prothorax, more rounded anterior angles, more divaricate hind angles, and wider elytra; length 13.5 mm. Schoharie, N. Y. . . . . . *exilis* Notman

22. Prothorax somewhat flattened or deplanate laterally, the side margins almost straight and gradually divergent backwards, outer margin of hind angles hardly more divergent, elytra evidently broader than prothorax at hind angles. 23

Prothorax with disk more evenly convex, barely flattened laterally, the sides almost straight or slightly arcuate and quite parallel, the hind angles distinctly more divergent than side margins, elytra barely broader than prothorax at hind angles 24

23. Species 15 mm. or more in length, antennæ in males narrow and quite filiform, fourth segment almost as long as broad and about equal to fifth in length, hind angles of prothorax long and rather acute, the disk finely, sparsely punctured at middle, more densely at sides; length 18-23 mm. Eastern North America.................................*pyrrhos* (Hbst.)

Species 14-15 mm. in length, antennæ in males more robust, fourth segment about one and a half times as long as broad and three-fourths length of fifth, hind angles of prothorax broad and more or less auriculate, disk coarsely, moderately closely punctured; length 14 mm. Middle Sierra of Calif..*macer* (Fall)

24. Antennæ in males narrow and filiform, segments 3-5 but little broader than the almost cylindrical ones that follow, disk of prothorax rather finely, moderately closely punctured, hind angles narrow and sharp; length 13-14 mm. Middle Sierra and northern Calif..........................*tenellus* n. sp.

Antennæ in males more robust and noticeably serrate, segments 3-5 evidently broader than those that follow, disk of prothorax umbilicately and closely punctured, hind angles broad and acute; length 9-16 mm. (Superficially looks much like an *Aplastus*.) Coastal area of southwestern Ore. and northern Calif....................................*jaculus* (Lec.)

25. Elytra vittate.. 26

Elytra and legs orange red, the head and prothorax black with æneous lustre.................................... 29

26. Prothorax black with hind angles alone flavous............... 27

Prothorax black with sides and sometimes median vitta flavous.. 28

27. Prothorax fully 4 mm. in length and with disk finely, not closely punctured, antennæ in males reaching middle of elytra or beyond, elytra with flavous vittæ extending laterally from second to seventh striæ, epipleuræ also flavous; length 13-14 mm. Southern Appalachian Mts..................*horni* O. Schw.

Prothorax but little more than 3 mm. in length and with disk more coarsely and closely punctured, antennæ in male not reaching beyond basal third of elytra, elytra marked as in preceding species; length 12.5 mm. Southern Ore....*patricius* n. sp.

28. Prothorax with broad yellow vitta close to side margins, elytra with yellow vittæ the breadth at most of from fourth to seventh striæ, epipleuræ and suture also yellowish; length 14 mm. Northern coastal counties of Calif..........*linearis* (Fall)

Prothorax with narrow median as well as lateral vittæ, sometimes reduced, hind angles very acute, each elytron with two three-intervals wide yellow vittæ, separated by a one-interval wide darker stripe; length 10 mm. Middle and western States.................................*bivittatus* (Melsh.)

29. Head and pronotum finely (or coarsely in female) densely punctured, clothed with rather coarse fulvous pile, prothorax convex with hind angles distinctly produced but blunt at apex, elytra finely striato-punctate with flattened and finely punctured intervals; length 10-12 mm. Female suggestive of a small bicolored *fraternus*. Southwestern Ore. and northwestern Calif..................................*humboldti* n. sp.

30. Prothorax as broad as long, very finely and rather closely punctured, a distinct incisure just within base of hind angles. Elytra finely and shallowly striate, intervals flat or barely convex, both striæ and intervals very finely punctured, light rufous, disk of pronotum sometimes piceous, and rather densely clothed with very short, fine pile; length 16-18 mm. Middle Sierra of Calif.......................*trunculentus* Cand.

Prothorax longer than broad, pronotum rather coarsely and closely punctured, especially at sides.................... 31

31. Upper surface entirely piceous to piceous or rufous with sides or hind angles of prothorax lighter in color than disk, never with prothorax entirely piceous or black above and the elytra rufous; length 12-18 mm. Southeastern Alaska to Maine, Allegheny Mts., northern Rocky Mts., and Sierra Nevadas of Calif..................................*volitans* Esch.

Upper surface with pronotum entirely black and elytra entirely red.......................................*rufipennis* (Fall)

32. Species moderately convex or somewhat flattened, with hind angles of prothorax rather short, broad at base, divergent and blunt at apices................................ 33

Species more generally convex and with hind angles narrower and more acute................................... 34

33. Pronotum coarsely, densely punctured, hind angles not carinate or with only the faintest indication of carina and flattened; length 10-13 mm. Alaska to Maine and especially throughout Pacific Coast................................*lobatus* Esch.

Pronotum finely, sparsely punctured, hind angles less divergent and with fine though distinct carina, elliptical in front of hind angles, black, shining and with legs piceotestaceous; length 10.5 mm. New Brunswick to Appalachian Mts.... ....*elongaticollis* (Ham.)

34. Elytra piceous or somewhat bronzed...................... 35

Elytra more or less fulvous or reddish..................... 37

35. Subcylindrical, piceous black with apex and sides of prothorax, epipleuræ, legs and antennæ more or less rufous; length 10-14 mm. Middle Sierra of Calif................*tahoënsis* n. sp.

Aeneous or bronzed species.............................. 36

36. Larger, quite convex, a violet bronze, the basal segments of antennæ, epipleuræ posteriorly and legs somewhat rufous; length 13 mm. Atlantic States, chiefly north and in mountains................................*atropurpureus* (Melsh.)

Smaller, but moderately convex, æneous and shining though quite pilose, the apex and hind angles of prothorax, suture and sides of elytra, antennæ, mouthparts and legs more or less rufous; length 4-6 mm. Dak., Man. and Alta........ ....*limoniiformis* (Horn)

37. Rather small and narrow species, the front sulcate, opaque, piceous, the elytra, tibiæ and tarsi generally more or less fulvous and rather conspicuously and evenly clothed with fulvous pile; length 8-10 mm. Pacific States........*opaculus* (Lec.)

Somewhat larger and broader species...................... 38

38. Smooth and shining, side margins of prothorax more or less evenly arcuate and divergent to apices of hind angles of prothorax, color piceous with apex and sides of prothorax, above and below, rufous, the elytra yellow with black markings along suture, obliquely from humeri, at middle of disk and towards apex; length 11-12 mm. Lake States to Nova Scotia and Maine...........................*appressus* (Rand.)

39. Third antennal segment short, equal to second or barely longer, fourth always much longer........................... 40

Third antennal segment somewhat cylindrical, always evidently longer than second, sometimes quite long, as long as fourth or even slightly longer.............................. 44

40. Rather large and elongate species, 12 mm. or more in length... 41

Smaller and shorter species, not over 8 mm. in length......... 43

41. Median antennal segments quite serrate and hardly one and a half times as long as broad, entirely æneous or with rufous elytra, pronotum deeply, often closely, somewhat cribrately punctured, elytra with both striæ and intervals distinctly punctured, general surface quite pubescent; length 13-15 mm. Southeastern Alaska and south along Cascades to Mt. Hood, Ore..............................*angusticollis* (Mann.)

Median antennal segments more elongate, twice as long as broad or longer.................................... 42

42. Black with rufous elytra, outer antennal segments fully twice as long as broad, the median segments barely so, pronotum finely, closely punctured, the hind angles sharp and quite divergent, elytra with striæ shallow and finely, not distinctly punctured, the intervals rather finely but not sharply punctured; length 12-15 mm. Southeastern Alaska to high altitudes of Cascades and Sierra Nevadas..........*sagitticollis* (Esch.)

Rufotestaceous throughout, fourth and following antennal segments long and narrow, from two to three times as long as broad, pronotum finely, rather closely punctured, side margin almost straight and divergent to apex of hind angles, elytra finely striate, the strial punctures very fine and more or less indistinct, the intervals flattened and finely, closely yet shallowly punctured; length 16 mm. Mt. Rainier, Wash..*rainieri* n. sp.

43. Piceous with rufotestaceous pronotum and propleuræ, and yellow elytra, the pronotum with a narrow V-shaped black marking extending forwards from the middle of the base and the elytra with a black diamond shaped patch at the apex, the basal segments of antennæ and tibiæ and tarsi pale, the outer segments of antennæ but slightly serrate, and the prothorax elongate, somewhat spatulate and rather finely but not closely punctured; length 8 mm. Siskiyou Co., Calif....................................*nunenmacheri* n. sp.

Black with yellow elytra except for black suture, the third antennal segment distinctly longer than second, the second and third together longer than fourth, the outer segments but slightly serrate, prothorax as broad as long, somewhat flattened and æneous, and finely, rather closely punctured; length 7 mm. Lake Superior region to Rocky Mts. and north to Alaska.............................*ochreipennis* (Lec.)

44. Species more or less elongate and subcylindrical, prothorax as long or longer than broad, hind angles distinctly prolonged and finely carinate, antennæ variable as to length, third segment shorter than fourth or barely equal to it, the median segments always much longer than broad................ 45

Species broader and generally flatter, prothorax as broad or broader than long, hind angles broad at base, antennæ generally short, rarely reaching beyond hind angles of prothorax, third segment long, often longer than fourth...... 60

45. Third antennal segment always distinctly shorter than fourth.. 46

Third antennal segment almost or quite equal to fourth in length 48

46. Elytra rufous, testaceous, or light brown in color............. 47

Elytra black, each elytron with a broad discal and narrow marginal flavous vitta, the pronotum with large median discal area and margins black, the remainder red, antennæ robust, reaching to end of basal third of elytra, second segment transverse, third three-fourths length of fourth and subcylindrical, fourth to tenth dilated and serrate; length 13-15 mm. Southern Alleghenies......................*trivittatus* (Lec.)

47. Head and pronotal disk black, the sides of pronotum and elytra rufous, surface conspicuously clothed with coarse pile, the prothorax subparallel at sides, the striæ of elytra rather coarsely punctured, antennæ delicate, third segment about three-fourths length of fourth and but little dilated apically, fourth to third moderately serrate; length 10 mm. Northern Calif....................................*shastensis* n. sp.

Head and median portion of pronotum more or less piceous, the remainder of upper surface varying from reddish brown to castaneous, surface rather sparsely clothed with short and fine hair, prothorax somewhat arcuate at sides and with divergent and prominent hind angles, elytral striæ fine and finely punctured, antennæ delicate, third segment three-fourths length of fourth and but slightly serrate; length 10-12 mm. Appalachian Mts. and from Maine to eastern B. C. and north...................................*insidiosus* (Lec.)

48. Prothorax somewhat quadrilateral, as broad anteriorly as posteriorly, rufous or rufopiceous, antennæ short, not reaching hind angles of prothorax............................. 59

Prothorax always definitely narrowed in front, antennæ reaching close to hind angles of prothorax or beyond............. 49

49. Elytra somewhat rufous or flavous, not metallic.............. 50

Upper surface either brilliantly metallic or with evident bronze lustre... 51

50. Moderately convex, conspicuously clothed with fine gray or slightly fulvous pile, head and prothorax black, the lateral margins of latter in female rufous, coarsely, deeply and rather closely punctured, pronotum deeply canaliculate posteriorly, elytra rufous, distinctly punctate-striate, somewhat coarsely so in female, legs rufotestaceous; length 11-15 mm. Lagunitas, Marin Co., Calif..................*blaisdelli* n. sp.

A small species, somewhat flattened, sparsely clothed with fine fulvous pile, head and prothorax black, the anterior and posterior angles of latter as well as basal segment of antennæ testaceous, head and pronotum rather finely, moderately closely punctured, the pronotum sometimes finely canaliculate posteriorly, elytra testaceous (in one phase piceous), sutural interval sometimes rufous, finely striato-punctate, legs more or less testaceous; length 8-10 mm. Eastern Canada to B. C. and south through Cascades and Sierra Nevadas..................................*falsificus* (Lec.)

51. Elongate and subcylindrical species with a slight coppery or metallic lustre.. 52

More flattened and less subcylindrical species, either brilliantly metallic or piceous with but faint bronze sheen........... 55

52. Smaller species averaging 10 mm. in length, third antennal segment slightly shorter in general than fourth.............. 53

Larger species, 12 mm. or more in length, third antennal segment generally equal to fourth in length...................... 54

53. More or less uniformly piceous, the upper surface faintly though evidently bronzed and clothed with fine pubescence, the latter not concealing the sculpturing of elytra, elytral intervals very finely, inconspicuously punctured; length 10 mm. Yukon Valley, Alaska to Great Lakes...............*mendax* (Lec.)

Piceous with distinct coppery lustre above, the legs, basal segment of antennæ and often margins of elytra reddish yellow, surface above clothed with rather coarse pile often partly concealing elytral sculpturing, elytral intervals rather conspicuously punctured; length 10-12 mm. Western foothills of Sierra Nevada Mts., Calif. and northwest into Ore.....
....*monticola* (Horn)

54. Prothorax and elytra slightly arcuate at sides, pronotum æneous, rather coarsely, closely punctured, canaliculation deep and at base, elytra with marked cupreous lustre, the intervals finely punctured, legs and epipleuræ somewhat rufous; length 13-15 mm. B. C. to Ore. west of Cascade Mts..*furtivus* (Lec.)

Prothorax and elytra more parallel, pronotum piceous with faint æneous lustre, anterior margin and hind angles rufous, punctures moderately fine, canaliculation generally extending forward to apex, elytra rufopiceous with faint cupreous lustre, the suture and margins rufous, the intervals rather coarsely punctured, somewhat rugose, legs rufous; length 12-16 mm. Eastern North America..........*cylindriformis* (Hbst.)

55. Brilliantly metallic species................................ 56

Species more or less piceous or rufopiceous and with only faint metallic lustre.. 58

56. Pronotum sparsely, finely punctured on disk, third segment of antennæ slightly shorter than fourth.................... 57

Pronotum coarsely, closely punctured over entire surface and fully as long, including hind angles, as broad, third segment of antennæ fully as long as fourth, color varying from brilliant green to deep copper; length 14 mm. Alaska to Great Lakes and Mts. of northeastern States, Rocky Mts., Cascade and Sierra Nevada Mts......................*resplendens* (Esch.)

57. Upper surface clothed with fine, sparse pile, pronotum fully as long as broad, with sides more or less straight and convergent in front and distinctly sinuate in front of hind angles, color varying from æneous to a rich copper; length 13 mm. High Mts. of N. C. to Catskills of N. Y. . . . . *appalachius* n. sp.

Upper surface quite glabrous, pronotum somewhat wider than long, sides broadly arcuate in front and almost parallel until just before hind angles, color generally a brilliant green; length 11 mm. Mts. of B. C. to Mt. Rainier, Wash. . *weidti* (Angell)

58. Piceous, slightly bronzed, hind angles of prothorax and small irregular area near elytral apices testaceous, prothorax slightly longer than broad, disk with coarse, closely placed umbilicate punctures; length 12 mm. Va. . . . . *copei* (Horn)

Rufopiceous, faintly bronzed and more or less clothed with fulvous pile, prothorax about as long as broad in males and with sides straight and convergent forwards, broader in females and with sides rather broadly arcuate, disk rather coarsely, closely punctured in males, more finely and sparsely in females, elytral striæ coarsely punctured, intervals flat in males, and rather definitely punctured, quite convex in females and very finely punctured; length 10-12 mm. Allegheny Mts. . . . . *divaricatus* (Lec.)

59. Prothorax definitely longer than broad, gradually broadened forwards until near anterior angles, disk with canaliculation at middle deep and complete, elytral intervals just perceptibly punctured; length 17 mm. Atlantic States. . . . . *sulcicollis* (Say)

Prothorax just perceptibly longer than broad, broadest about middle, disk with canaliculation defined only in basal half, elytral intervals rather finely yet distinctly punctured; length 14 mm. Vanc. Is. inland through Great Basin to Ariz. . . . . *rupestris* (Germ.)

60. Hind angles of prothorax prominent, elongated, more or less subacute at apex and with well defined carinæ, species in general glabrous or at most not densely pilose. 61

Hind angles of prothorax in most cases broad, short and truncate or very blunt at apex and with fine or poorly defined carinæ, species in general clothed with a dense closely applied pile and, except in *planus*, with elytra more or less yellow. 77

61. Species clothed with a coarse yet not very dense pile. 62

Species almost glabrous, the pubescence at most very fine and sparse. 65

62. Elongate species, over three times as long as broad. 63

Shorter and broader species, barely three times as long as broad at most. 64

63. Piceous or black, epipleuræ and legs somewhat rufous, pile fulvous, antennal segments 4-6 strongly dilated, the following gradually narrower and more elongate, pronotum coarsely, densely punctured, elytral striæ deep but rather finely punctured, the intervals very definitely punctured; length 12 mm. Central Calif. to eastern Wash. and B. C. .... *fusculus* (Lec.)

Rufopiceous or piceous, the elytra varying from flavous with suture, a short vitta extending backwards from humeri and subapical patch, black, to almost entirely black, antennæ and pronotum as in preceding species. Elytral striæ rather deep and coarsely punctured, the intervals conspicuously punctured but less evident than in *fusculus;* length 11-16 mm. Colorado and coastal areas of Pacific Coast from middle Calif. to B. C. .... *semivittatus* (Say)

64. Piceous generally with slight æneous lustre, legs and epipleuræ often somewhat reddish, intermediate antennal segments moderately dilated, elytral striæ well impressed and finely punctured, the intervals finely, rather densely punctured; length 8-12 mm. The northern U. S. and southern Canada from the Atlantic to the Pacific .... *inflatus* (Say)

65. Prothorax very broad, as broad or broader than long, but slightly convex and densely punctured at least at sides where punctation is generally approximate or even confluent 66

Prothorax less broad, more convex and less densely punctured.. 71

66. Species not metallic or with but a slight metallic gloss......... 67

Species with elytra or entire upper surface brilliantly metallic.. 70

67. Third antennal segment not quite as long as fourth, segments 4-11 all considerably longer than broad, and antennæ as a whole reaching beyond hind angles of prothorax, pronotum very coarsely, densely punctured, hind angles rather abruptly divergent, scutellum rather sparsely pubescent, elytra deeply striate, striæ moderately finely closely punctured, intervals finely punctured and sometimes finely rugulose, entirely black or rarely reddish near lateral margin; length 13-15 mm. Yukon Valley, Alaska, eastern B. C., Alta. to Mt. Rainier, Wash .... *morulus* (Lec.)

Third antennal segment fully as long or longer than fourth.... 68

68. Median antennal segments but little longer than broad, pronotum varying from rather dense to somewhat sparse punctation, hind angles prominent but short and blunt at apex, scutellum densely clothed with gray pubescence, elytra with striæ moderately impressed and rather coarsely, densely punctured, the intervals convex and finely punctured, entire upper surface shining, pubescence hardly evident, color of upper sur-

face varying from yellow or straw color, with prothoracic disk and margins, the elytral suture, an elongate humeral vitta and transverse postmedian spot, black, to entirely black; length 11-15 mm. The more northern parts of the U. S., most of Can., the northern Rocky Mts. and the Cascade and Sierra Nevada Mts., also northern Europe and Asia.......................................*cruciatus* (Linn.)

Median antennal segments much longer than broad, hind angles of prothorax long and prominent, scutellum rather sparsely clothed with gray pubescence, the punctures of elytral striæ fine, hardly coarser than those of intervals, the upper surface in general less shining because of the more evident pubescence.. 69

69. Upper surface generally moderately shining, the pubescence at most fine and sparse, prothorax broader than long, with sides distinctly arcuate, somewhat rapidly narrowed in front, the disk rather coarsely, closely punctured even at middle, entirely black or with sides of prothorax red; length 13-16 mm., western Ore. and northern Calif.................*carbo* (Lec.)

Upper surface rather dull and pruinose as a result of rather definite though fine pubescence over entire area, prothorax about as broad as long, the sides but slightly arcuate and gradually narrowing forwards, the disk coarsely punctured at sides but rather finely and sparsely so at middle, always dull black; length 12-16 mm. The more northern parts of Great Basin from Wasatch to Sierra Nevada Mts. .*pruininus* (Horn)

70. Elytra alone brilliantly metallic, ranging from green to a violet bronze, head and pronotum a dull black and latter always much broader than long at middle, elytral striæ rather finely punctured; length 9-20 mm., average 13 mm. Entire northern part of continent, the Rocky, Cascade and Sierra Nevada Mts....................................*æreipennis* (Kirby)

Head and prothorax as well as elytra a coppery bronze, prothorax about as broad as long at middle, elytral striæ rather coarsely punctured; length 10-11 mm. Northeastern States ....*splendens* (Zeigl.)

71. All antennal segments beyond third more or less evidently longer than broad, the antennæ either reaching hind angles of prothorax or beyond.................................... 72

Fifth and sixth or following antennal segments, more or less transverse, but little longer than broad, the antennæ not reaching or barely reaching the hind angles of prothorax.. 75

72. Species somewhat elongate, black or black with fulvous markings, and quite shining, legs generally dark in color....... 73

Species blunter and shorter, upper surface in the main piceous or black with æneous or submetallic lustre, the antennæ, legs, epipleuræ and often other portions of body beneath more or less rufous.. 74

73. Larger species, 13 mm. or over in length, pronotum and elytra quite glabrous, prothorax about as broad across middle as at apices of hind angles, the punctures at middle of disk generally fine and not closely placed, elytra with striæ well impressed and distinctly punctured, the intervals convex and minutely punctured, color varying from entirely black to black with elytra maculated with yellow (typical form), the yellow markings in the form of an irregular lunule extending from the outside of humerus to near the suture at the middle and a more or less transverse post median blotch; length 13-17 mm. Western B. C. south to Willamette Valley, Ore..*suckleyi* (Lec.)

Smaller species 12 mm. or less in length, pronotum and elytra rather sparsely but evidently clothed with fine gray or fulvous pile, prothorax narrower at middle than at hind angles, punctures of disk fine or moderately coarse, elytra with striæ finely or moderately impressed and finely to coarsely punctured, the intervals flat or slightly convex, color varying from all black to black with yellow markings, the latter sometimes on sides of prothorax though generally confined to elytra where there is a marginal vitta and an irregular discal vitta, the latter dilated at base, at middle where it sometimes divides the black sutural and lateral vittæ, and subapically; length 8-12 mm. Extends from western B. C. to northern Calif. and through northern Great Basin to Wasatch Mts. of Utah...........................*leucaspis* Germ.

74. Prothorax with sides rather broadly rounded to apex, hind angles short and blunt at apex, the elytral striæ well impressed and intervals convex towards base, the upper surface æneous, the prothorax with apical margin and hind angles rufous, beneath the lobe of prosternum, propleuræ, epipleuræ, legs and much of abdomen rufous; length 11 mm. Eastern Can. and northeastern States.............................*aratus* (Lec.)

Prothorax with sides rapidly narrowing from middle to apex, hind angles rather long and subacute, the elytral striæ finely impressed except close to base and intervals generally quite flat, the upper surface rather uniformly black or æneous, the hind angles of prothorax at most faintly reddish, beneath with prosternal lobe, epipleuræ and legs reddish; length 10-12 mm. Manitoba and Great Lakes to Maine as well as northern Europe and northern Asia..................*metallicus* (Payk.)

75. Large species, 15 mm. or more in length, the antennæ about reaching hind angles of prothorax in males, the median segments broadly triangular and almost as broad as long, pronotum evenly and distinctly but not closely punctured on disk, elytra at base with striæ well impressed and intervals slightly convex, apically the striæ more finely impressed and intervals flat, striæ and intervals evidently punctured, coal black and shining; length 15-25 mm. Atlantic States. *æthiops* (Hbst.)

Smaller species, 14 mm. or less in length, the antennæ never reaching hind angles of prothorax...................... 76

76. Hind angles of prothorax broad at base and more or less directed backwards, elytral intervals somewhat convex and conspicuously punctured, upper surface finely, sparsely pilose and dull, color ranging from all black to black with reddish antennæ and legs, epipleuræ and prothorax; length 11-13 mm. Ore. and Calif.......................... *conjungens* (Lec.)

Hind angles of prothorax not broadly triangular but peg-like and rather suddenly divergent, elytral intervals flattened or barely convex and minutely punctured, upper surface somewhat smooth and shining, color ranging from all black to black with lateral margins or all of prothorax red; length 10-13 mm. Atlantic States and Pacific States.... *rotundicollis* (Say)

77. Hind angles of prothorax with more or less evident carinæ..... 78

Hind angles of prothorax without clearly defined carinæ....... 86

78. Entire body black, antennæ and legs sometimes rufous, pile fine, short and not dense, not concealing the sculpturing, antennæ extending beyond hind angles of prothorax and with segments 4-10 markedly serrate, a smooth longitudinal line at middle of pronotum and carinæ of hind angles evident but not distinctly defined; length 11 mm. Colo........... *planus* (Lec.)

Body more or less bicolored............................. 79

79. Head and entire pronotum as well as underside black, the elytra rufous or bicolored................................. 80

Prothorax brown or rufous or at least with hind angles light, the elytra orange or bicolored.......................... 83

80. Elytra entirely rufous or orange, in *fallax* occasionally piceous, carinæ distinct and well separated from margin........... 81

Elytra bicolored.. 82

81. Pile of upper surface rather long and fulvous, variously directed on both pronotum and elytra so as to form a distinct pattern, the elytra so minutely and closely punctured that it appears granular, legs generally piceous though tibiæ and tarsi or tarsi alone somewhat rufous; length 9-13 mm. Entire northern part of continent.......................... *fallax* (Say)

Pile of upper surface shorter and less dense though fulvous, the sculpturing beneath more evident, no distinctive pattern formed by pile on elytra, elytra finely and closely punctured but not granular, legs reddish yellow; length 9-12 mm. Eastern Canada and northeastern States.........*medianus* (Germ.)

82. Antennæ long, extending well beyond hind angles of prothorax, the intermediate segments much longer than broad, prothorax more elongate than usual in the group, gradually narrowing from middle to apex, elytra with striæ well impressed and rather coarsely punctured, orange yellow with a broad oblique black band in front of middle, not reaching sides or suture and another triangular black area posterior to middle, legs somewhat rufous; length 10-12 mm. Lake States to B. C., Colo. and northeastern Calif.....*nigricollis* (Bland)

Antennæ short, barely reaching hind angles of prothorax in males, the intermediate segments hardly longer than broad, prothorax broad and well rounded at middle, rather suddenly narrowed before apex, elytra much flattened, with striæ finely impressed and finely punctured, orange yellow with apical region more or less piceous, the upper surface rather densely clothed with fulvous pile, variously directed so as to form a distinctive design as in *fallax*, antennæ and legs black, the tarsi rufous; length 7-9 mm. The middle Sierra Nevada Mts. of Calif.............................*candezei* Leng

83. Species broad and flat with unicolored elytra, the head and prothorax brown or sometimes piceous, elytra short, barely reaching hind angles of prothorax, the intermediate segments but slightly longer than broad, prothorax very broad at middle, sides conspicuously arcuate, suddenly narrowed to apex and to base of hind angles, the hind angles short but triangular, abruptly divergent and apically elevated, elytra with striæ finely impressed and rather indistinctly punctured, orange in color, the upper surface densely clothed with conspicuous orange pile, variously directed so as to form a distinctive design, underside black, the tibiæ and tarsi rufous; length 8 mm. Middle and southern Sierra of Calif...*mirabilis* (Fall)

Species more or less elongate, somewhat convex and elytra bicolored.. 84

84. Prothorax black or piceous with hind angles reddish yellow.... 85

Entire prothorax a reddish brown, quite convex, the sides gradually narrowed from before middle to apex, hind angles prominent, elytra with striæ evidently impressed and moderately coarsely punctured, straw yellow with a triangular or hooked dark brown maculation on apical third, the pile on upper surface fulvous, short and not dense, antennæ, legs and entire under surface rufous; length 9-11 mm. Atlantic States....................................*hamatus* (Say)

85. Prothorax piceous, bronzed and with hind angles reddish, moderately prolonged, and with carinæ parallel to lateral margins, elytra yellow with striæ well impressed and finely punctured, ornamented with short humeral lunules, elongate triangular black markings on second and third intervals before middle and posteriorly with an irregular hooked marking with long arm close to suture and a transverse hook directed outwardly and backwards just behind middle, antennæ, legs, prosternal lobe and propleuræ rufous, the remainder of underside piceous; length 11-13 mm. Eastern North America..........................*hieroglyphicus* (Say)

Posterior angles of prothorax, legs and apical area of abdomen rufous, the head, antennæ as a rule, and remainder of prothorax and underside of body black, prothorax moderately convex, sides arcuate and gradually narrowing to apex, the hind angles short, decidedly truncate at apex and with carinæ sometimes distinct, at other times obscure, but parallel to margin, elytra orange yellow with striæ finely impressed and finely punctured, the intervals quite flat, the black markings somewhat similar to those of preceding species but in general much reduced, especially in the large western forms, to a posthumeral spot, a spot on second interval internal to the preceding and often united with it, and a transverse postmedian lunule, with concavity directed backwards; length 9-14 mm. Northern parts of country from Maine and Nova Scotia to Pacific, the Rocky, Cascade, and Sierra Nevada Mts...............................*propola* (Lec.)

86. Prothorax fully as long at middle as broad.................. 88

Prothorax broader than long at middle..................... 87

87. Entire body black except elytra, prothorax with sides arcuate and narrowed from before middle to apex, hind angles moderately prolonged with carinæ sometimes faintly indicated, the elytra with striæ very finely impressed, sometimes obliterated on disk and finely punctured, orange yellow, with a subbasal black spot on second, third and fourth intervals, a large common black W-shaped marking slightly behind middle, sometimes broken at suture, and the apices often tipped with black; length 9-10 mm. The middle Sierra Nevada Mts. of Calif.......................*exclamationis* (Fall)

Entire body black except elytra, prothorax with sides evenly arcuate, hind angles short, carinæ sometimes vaguely indicated, elytra with striæ finely impressed and finely punctured, yellow or reddish orange with two transverse zigzag black markings, one midway between base and middle, the second at middle, and a black lunule or triangular area near apex; length 8-12 mm. Northern parts of continent, Rocky, Cascade and Sierra Nevada Mts. . . . . *triundulatus* (Rand.)

88. Entire body black except elytra, prothorax with sides evenly but not broadly arcuate, hind angles with outer margin much elevated and without trace of carinæ, disk shining even though sparsely clothed with fulvous pile like head and elytra, elytra narrow and somewhat pointed apically, of an orange yellow with apical area somewhat piceous, the striæ finely impressed and very finely punctured; length 9 mm. B. C., Yukon T., Mt. Rainier, Wash. . . . . *hoppingi* n. sp.

89. Fourth antennal segment broader and generally longer than third segment, pronotum with punctures well separated on disk, densely placed at sides, sides of prothorax faintly sinuate in front of hind angles, thence arcuately convergent forwards, color varying from entirely piceous with æneous lustre to piceous with basal segments of antennæ, most of legs, epipleuræ and the following elytral markings, a basal spot, an oblique median and sub-apical bar, with narrow outer margin, yellow; length 5-9 mm. Alaska to Alta., Lab. and N. H. . . . . *costalis* (Payk.)

Fourth antennal segment not or hardly broader than third and always of about the same length. 90

90. Pronotum with punctures well separated over entire area, somewhat similar to *costalis* but prothorax smaller, more compressed at center, sides more parallel, hind angles more divergent; length 6-7 mm. Lake States to N. H. and Me. . . . . *estriatus* (Lec.)

Pronotum very finely, closely punctured throughout, the prothorax moderately robust, sides well rounded in front, almost parallel behind or slightly sinuate in front of hind angles, the latter slightly divergent, basal margin between angles almost transverse. Color much as in *costalis* but the colored females with only a triangular marginal spot behind the humerus instead of the oblique band; length 5-6.5 mm. Cascade Mts. from Mt. Rainier, Wash., to Mt. Hood, Ore. . . . . *granicollis* n. sp

Ludius cribrosus (LeConte)

This well known species which ranges throughout much of western Oregon and California has been shown by careful field studies to be decidedly polymorphic, the male being the typical *cribrosus* and the female, larger, broader and flatter, the typical *maurus* (Lec.). In the southern Sierra Nevada Mountains, along with normal robust males and females are often to be found giant females. These are *colossus* (Lec.) and differ from ordinary females not only by being generally larger but by having a more shining appearance, the sides of prothorax more arcuate, and the elytral intervals absolutely flat, the usual well impressed striæ almost obliterated or indicated by very finely impressed lines. The *Corymbites rufipes* Mots., I believe to be but a variety of this species. I have several male specimens of *cribrosus* with rufous legs.

Ludius uliginosus Van Dyke, new species

Moderately elongate yet robust, entirely coal black except tarsal claws which are rufous, the head and prothorax sparsely clothed with a few curved hairs, the elytra with only minute and widely scattered hair. Head slightly convex, coarsely, cribrately punctured; antennæ barely reaching hind angles of prothorax in males, shorter in females, second segment short and transverse, third triangular, little longer than broad and fully as long as fourth, fourth to sixth triangulår and almost as broad as long, the following gradually narrowed. Prothorax longer at middle than broad, hind angles robust, slightly diverging with well marked carinæ, sides oblique, though somewhat sinuous, and gradually converging from apices of hind angles to near apex, thence arcuate to apex; disk moderately convex and strongly, closely and at sides cribrately punctured, the margin narrow and poorly defined, canaliculation well defined at middle near base; scutellum elliptical and finely punctured and hairy posteriorly. Elytra almost three times as long as prothorax and over twice as long as broad, quite convex, disk with striæ deeply impressed and finely punctured, the intervals convex, distinctly punctured and very rugose. Beneath very coarsely, umbilicately punctured on prothorax, cribrately on propleuræ, finer and sparser on metasternum and still finer on abdomen though close at sides and on last adbominal segment. Male, length 13.5 mm., breadth 4 mm.; female, length 15 mm., breadth 5 mm.

Holotype: Male, No. 3164; and *Allotype:* Female, No. 3165, Mus. Calif. Acad. Sci., and several designated *Paratypes* from a series of thirty specimens collected by myself from the bunch grass in a swamp near **Carrville, Trinity Co., Calif.,** June 6, 1913. I also have two specimens from Bon Accord, B. C., which differ only in having a slight bronzy lustre.

This very black and generally dull species superficially more closely resembles the common California *Megapenthes aterrimus* (Mots.) than it does any of the other members of its own genus. From the large black species of *Ludius* like *morulus* (Lec.) and *carbo* (Lec.), it can always be told by its more convex and gradually narrowed prothorax and quite rugose elytra as well as by the antennal peculiarities.

Ludius obscurus (LeConte)

The type is, I believe, the only known specimen of this species. I have several times examined it without being able to assign it, even as an eberrant specimen, to any other species.

Ludius silvaticus Van Dyke, new species

Elongate, narrowed in front and behind, upper surface but moderately convex, black, slightly shining, moderately clothed above with short silvery white pile, longer and denser beneath, giving the insect a plumbeous appearance, the larger females often submetallic and with a violet sheen, the legs sometimes rufous. Head slightly convex, coarsely rugosely punctured; antennæ long, reaching two segments beyond hind angles of prothorax in males, about reaching apex in females, second segment but little longer than broad, third twice as long, triangular, almost as wide or as wide at apex as fourth, the following elongate triangular and gradually narrowed. Prothorax distinctly longer than broad, hind angles long, narrow, blunt at apex and strongly diverging, less narrowed and less diverging in females, carinæ long and prominent, sides gradually narrowing, slightly arcuate at middle, more parallel in females; disk moderately convex, densely punctured, median canaliculation distinctly defined throughout, deeper behind. Elytra not quite three times as long as broad, subparallel in front, gradually narrowed apically, disk distinctly striate, the striæ finely, closely punctured, intervals slightly convex, rather densely punctured and slightly rugose. Beneath coarsely, densely punctured on propleuræ, more sparsely on prosternum and finely, densely on afterbody. Male, length 15 mm., breadth 4 mm.; female, length 19 mm., breadth 5 mm.

Holotype: Male, No. 3166; and *Allotype:* Female, No. 3167, Mus. Calif. Acad. Sci., and several designated *Paratypes* in my collection, the first from **Fallen Leaf Lake, Lake Tahoe** region, Calif., July 1, 1915, and the second from the Nash Mine, 6000 ft. alt., northern Trinity Co., Calif., June 14, 1913. This elongate, pruinose species is fairly common and widely distributed throughout the coniferous forests of the Pacific States. I have a large series including representatives from Moscow Mt., Idaho, Lake Quinault, Wash., Corvallis, Ore., and from numerous localities in the mountains of northern California and the Sierra Nevadas as far south as Fresno Co. It also varies greatly as to size, the females generally far larger and more robust.

This species somewhat resembles *Ludius protractus* (Lec.) but the latter has the prothorax more definitely cuneate, with the sides evidently deplanate, and without median canaliculation. It also closely resembles *Ludius fraternus* (Lec.) and is often listed as such but the latter has the prothorax slightly shorter, the median canaliculation vague at the most, and the third antennal segment but little longer than the second and the following segments more evidently bilaterally dilated. It is also to be found in a similar environment and in fact replaces *fraternus* in the more southern forests of the Pacific Coast.

Ludius protractus (LeConte)

This species is also widely distributed along the Pacific Coast but it is a species of the meadows. In British Columbia, Washington and Oregon, it is uniformly pruinose in color but in Shasta and Siskiyou counties of California, it often appears of a rufotestaceous color. This is the variety *jouteli* (Dow) and nothing more than a color phase. *Ludius anthrax* (Lec.) is also an offshoot of the same stock but it has diverged enough to warrant it being considered as a distinct species. It is in general broader, more robust, with longer and heavier antennæ, and very black and shining, the pubescence only evident under high magnification.

Ludius aplastoides Van Dyke, new species

Elongate, convex, rather blunt in front, somewhat narrowed behind, reddish brown, head and prothorax darker, generally black, and conspicuously but not densely clothed with fulvous pile. Head flattened or slightly sulcate, rather densely, coarsely punctured; antennæ long and robust, reaching three segments beyond hind angles of prothorax in male, second segment small, barely longer than broad, third large and triangular, twice as long as second and fully as long as fourth, the fourth almost as broad as long, the segments 5-10 gradually narrower, the tenth not quite twice as long as broad, and all distinctly serrate. Prothorax one-eighth longer at middle than broad, hind angles robust and triangular, acute, moderately diverging and finely carinate, sides feebly arcuate from base of hind angles to near apex; disk convex at middle, more or less depressed or flattened laterally, without median canaliculation and coarsely, rather densely punctured especially at sides. Elytra two and a half times as long as broad and two and a half times as long as prothorax at middle, sides barely arcuate at middle, gradually narrowing and rounded to apex, the disk convex, striæ well impressed and finely punctured, the intervals convex, finely punctured and distinctly, transversely rugose. Beneath coarsely, rather closely punctured in front, the propleuræ somewhat more closely than prosternum, and finely, rather closely punctured behind. Length 15-16 mm., breadth 4 mm.

Holotype: Male, No. 3168, Mus. Calif. Acad. Sci., and several *Paratypes* in my collection from a series of twenty-nine specimens collected by Mr. E. Zimmerman in the hills back of **Oakland, Calif.,** May 7-11, 1930. Several designated paratypes and the majority of the specimens remain in Mr. Zimmerman's collection. I also have a single specimen collected at Sebastopol, Sonoma Co., Calif., in July 1915, by Mr. Hora. All specimens examined seem to be males.

This species belongs in the key immediately after *protractus* Lec., from which it differs by being more convex and narrower, less narrowed both in front and behind, by being mostly brown in color instead of black (typical phase), the pile somewhat longer and more erect, the general surface less shining, the median segments of antennæ more robust, the prothorax more parallel, the hind angles shorter and less acute, and the elytral intervals conspicuously convex and rugose. Superficially it also looks much like the larger specimens of *jaculus* (Lec.), but differs by having far more robust antennæ, the disk of pronotum simply punctured, not punctured with coarse, umbilicate punctures, the hind angles of prothorax triangular, not more or less auriculate, and the elytral intervals rather coarsely rugose. It is strange that such a large and conspicuous species should remain so long unknown in such a well collected region.

Ludius jaculus (LeConte)

Corymbites teres Lec. is nothing more than the female of this species, as I have found by a careful examination of the type. The males also vary considerably, both as regards size and length of prothorax and development of the hind prothoracic angles. The Oregon specimens are generally much larger and better developed in every regard than are those to be found in the San Francisco bay region.

Ludius atlas Van Dyke, new species

Elongate yet broad, quite flattened, black, shining; pubescence short, black, not evident except under magnification. Head flattened in front, moderately coarsely and densely punctured, antennæ extending two segments beyond hind angles of prothorax in males, just reaching apices in females, second segment small, slightly longer than broad, third twice as long, longer than fourth and fully as broad at apex, segments 3-10 elongate serrate, gradually diminishing in width towards apex. Prothorax a fourth longer than broad, hind angles triangular and conspicuously prolonged, blunt at apex, slightly divergent, carinæ long, narrow and somewhat divergent from sides, sides moderately sinuate in front of hind angles, arcuate towards middle and gradually narrowed forwards, lateral margin conspicuous, disk slightly convex, finely, rather densely punctured throughout and vaguely canaliculate at middle. Elytra two and three-fifths times as long as broad and as long as prothorax, subparallel in front, gradually narrowed from middle to apex, disk moderately convex, deeply striate and with striæ finely, closely punctured, intervals very convex, finely, rather densely punctured. Beneath coarsely, rather sparsely punctured on prosternum, finely and very densely on propleuræ and still more finely and quite closely on afterbody. Male, length 18 mm., breadth 5.25 mm., female, length 20 mm., breadth 6 mm.

Holotype: Male, No. 3169; and *Allotype:* Female, No. 3170, Mus. Calif. Acad. Sci., and two *Paratypes* in my collection, three including the first two, collected by myself at **Meadow Valley, Plumas Co., Calif.**, June 5, 3 and 6, 1924, the fourth collected on Red Mt., Nevada Co., Calif., July 3, 1911, by Dr.

C. Von Geldern. Other specimens in my collection are a male from Eldorado Co. and two large females, bearing simply the "Calif." label. One of the females is 25 mm. long and proportionally robust, superficially looking like a large *Ludius æthiops* (Herbst.). I have also examined several other specimens in the collection of the California Academy of Sciences.

This very large and coal black species, somewhat suggests *æthiops* as stated above, both because of its color and size. It is, however, more or less closely related to *Ludius volitans* Esch., as shown by its general facies though very easily separated from that, as from others associated with that, by the convex elytral intervals, greater width and coal black color. *Ludius anthrax* (Lec.) though often as large and of similar color, is much narrower, with heavier antennæ, and coarser pronotal punctation.

Ludius dolorosus Van Dyke, new species

Elongate, subparallel, moderately flattened, black, hardly shining, sparsely clothed with short cinereous pile. Head depressed in front, coarsely, densely punctured; antennæ reaching two segments beyond hind angles of prothorax in male, hardly reaching base of angles in female, second segment small, but little longer than broad, third fully twice as long, just perceptibly longer than fourth, segments 3-10 elongate serrate and gradually narrowing towards apex. Prothorax over one-fourth longer than broad, hind angles long, blunt at apex and strongly divergent, carinæ long, sharp and close to border, sides almost parallel from in front of hind angles to near apex where evenly rounded, slightly arcuate in females; disk flattened at middle, depressed towards sides, coarsely, closely punctured, cribrately and umbilicately at sides, distinctly canaliculate at middle, less evidently so in female. Elytra slightly more than twice as long as prothorax, subparallel in front, gradually narrowed posteriorly, striæ distinctly impressed, finely, closely punctured, intervals convex, moderately coarsely punctured and slightly rugose. Beneath coarsely, moderately closely punctured on prosternum, coarsely, very closely punctured on propleuræ, finely and closely punctured on afterbody.

Holotype: Male, No. 3171; and *Allotype:* Female, No. 3172, Mus. Calif. Acad. Sci., and several designated *Paratypes* in my collection from a series of thirteen specimens. The first was collected in **Lagunitas Cañon, Marin Co., Calif.,** April 11, 1915, the second from Fallen Leaf Lake, Lake Tahoe region, Calif., June 20, 1915, and the others in Humboldt Co., Eldorado Co., Yosemite Valley, and various localities near San Francisco Bay.

This species is undoubtedly very closely related to *Ludius fulvipes* (Bland), differing from the same in the main by being slightly more robust, with antennal segments less dilated, the pronotum more coarsely punctured, the elytral intervals more convex and the legs generally black (piceous brown or red in rare cases). These two species with *exilis* Notman stand well apart from all others in our fauna. The new species has often been mistaken for *moerens* (Lec.) but a careful examination of the type of the latter has shown that it is but a subspecies of *lobatus* (Esch.) as I will more fully bring out when discussing that species.

Ludius tenellus Van Dyke, new species

Elongate, narrow, subparallel, reddish brown, clothed with short, sparse pile. Head broadly, shallowly sulcate in front, coarsely, densely punctured, eyes of male prominent; antennæ in male almost filiform, reaching beyond first third of elytra, second segment small, hardly longer than broad, third two and a half times as long, slightly broadened apically, segments 4-10 two to three times as long as broad, subparallel and gradually diminishing in breadth apically, female antennæ slightly more robust and just reaching beyond hind angles of prothorax, prothorax distinctly longer than broad, hind angles triangular, elongate, slightly divergent, carinæ fine, long, close to margin, sides almost straight and convergent forwards from base of hind angles, disk slightly convex, deplanate at sides especially posteriorly, coarsely, quite closely punctured, not evidently canaliculate at middle, the females with sides more parallel and disk more convex. Elytra over three times as long as prothorax and three times as long as broad, sides subparallel, gradually rounded to apex, disk finely striate, the striæ finely, closely punctured, intervals flat, finely, irregularly punctured and slightly rugose. Beneath moderately finely, not densely, punctured on prosternum, very densely on propleuræ and finely, rather closely punctured on afterbody. Length 13 mm., breadth 3.5 mm., females slightly broader and more generally robust.

Holotype: Male, No. 3173; and *Allotype:* Female, No. 3174, Mus. Calif. Acad. Sci., and three designated *Paratypes* from a series of seven specimens, the first collected at **Fallen Leaf Lake, Lake Tahoe region, Calif.**, July 13, 1909, the allotype at Meadow Valley, Plumas Co., Calif., June 19, 1924, the others from Fallen Leaf Lake, Humboldt Co., and Castella, Shasta Co., Calif.

This very narrow species which has somewhat the facies of *Athous brightwelli* (Kirby) belongs very near *Ludius macer* (Fall) but is slightly smaller, with less robust antennæ, shorter and less cuneate prothorax, and with hind angles subacute and slightly divergent, not broad and auriculate as in the latter.

Ludius patricius Van Dyke, new species

Elongate, narrow, subparallel, black, slightly æneous with hind angles of prothorax, a broad vitta extending from the second to seventh striæ and from base to apex of each elytron, the epipleuræ and legs pale luteous and sparsely clothed with very fine pale hair. Head slightly depressed in front, rather coarsely, closely punctured; antennæ long and narrow, reaching to end of basal third of elytra, second segment small, hardly longer than broad, third fully two and a half times as long, dilated at apex and almost equal in length to fourth, segments 3-10 elongate, serrate, gradually narrowing, the last four subparallel. Prothorax not quite a third longer than broad, hind angles broad, auriculate yet projecting well backwards, sides almost straight and but slightly convergent forwards; disk slightly convex, rather coarsely, closely punctured, not canaliculate at middle. Elytra almost three times as long as prothorax and over three times as long as broad, sides subparallel in front, gradually narrowed posteriorly, disk finely striate, the striæ rather coarsely, closely punctured and finely rugose. Beneath with prosternum rather finely, not closely punctured, propleuræ densely punctured, and the afterbody in general finely, rather closely punctured. Length 13 mm., breadth 2.75 mm.

Holotype: Male, No. 3175, Mus. Calif. Acad. Sci., a unique in my collection from **Stella, Wash.**, collected April 27, 1915.

This elegant species in facies and color pattern very closely resembles *Ludius horni* Schwarz but differs from that by being slightly shorter, with shorter and black antennæ instead of red, shorter and more coarsely punctured pronotum, and shorter elytra. From *Ludius linearis* (Fall); it differs in the main by having only the hind angles of prothorax luteous, the black sutural vitta of elytra narrower, and the sides of pronotum not flattened.

Ludius humboldti Van Dyke, new species

Elongate, narrowed in front and behind, black. Elytra, tibiæ and tarsi rufotestaceous, in the type male a slight darkening or infuscation near the suture, and rather conspicuously though not densely clothed with fulvous pile. Head slightly flattened in front, finely, sparsely punctured; antennæ long, somewhat filiform, reaching to end of basal third of elytra, second segment small, little longer than broad, third about two and a half times as long and as long as fourth, segments 3-10 slightly serrate, gradually narrowed towards apex, the posterior segments subparallel. Prothorax slightly longer than broad, hind angles narrow and slightly divergent, carinæ rather fine, sides slightly arcuate at middle and narrowed forwards; disk somewhat convex and finely, moderately densely punctured. Elytra over three times as long as prothorax, finely striato-punctate, intervals flattened, and finely punctured. Beneath finely, rather sparsely punctured except propleuræ which are more coarsely, closely punctured. Length 10 mm., breadth 2.75 mm.

With this male, I have associated a female which I am confident is the opposite sex of the same species. It is somewhat larger, more generally convex and robust, with coarser pronotal punctation, and antennæ just reaching hind angles of prothorax. Length 12 mm., breadth 3.5 mm.

Holotype: Male, No. 3176; and *Allotype:* Female, No. 3177, Mus. Calif. Acad. Sci., the first collected by Mr. F. W. Nunenmacher at **Kirby, Josephine Co., Oregon,** June 11, 1910, the second from Humboldt Co., Calif. The species is no doubt characteristic of the cool and moist Humboldt region of California and the adjacent part of Oregon.

This rare species somewhat suggests a very small specimen of the bicolored phase of *Ludius fraternus* Lec. but has a very different type of antennæ; the male is also much narrower, more delicate and with longer antennæ, the female more robust.

Ludius truculentus Candeze

This very distinct though uncommon species has been collected only about Lake Tahoe, the Yosemite Valley and the middle Sierra Nevada generally. Though placed near *volitans,* it is generally larger, more densely pilose, with a much broader prothorax, and shorter, finer and more divergent hind angles.

Ludius volitans Eschscholtz

The typical phase of this species is found throughout southeastern Alaska, western British Columbia and southward at higher elevations along the Cascade Mountains of Washington and Oregon. In the high Sierra Nevada Mountains they are apt to be of a brighter color, more or less orange and the males at times with a dark spot near the end of each elytron. The more northern phases vary considerably in color from the usual rufous with piceous head and prothorax, or prothorax without disk piceous, to an all piceous form. In Alberta, Manitoba and the adjacent parts of the United States, the specimens are generally piceous, with the prothorax less angulated at the sides and narrowed in front, as well as more convex. These gradually pass into the subspecies *spinosus* (Lec.) found abundantly about the Great Lakes and the country to the east. More or less associated with the typical form in southeastern Alaska is a phase that is quite piceous with the hind angles of the prothorax testaceous, the prothorax also quite spatulate and the hind angles very divergent. This is *umbricola* Esch. which I am at present unwilling to consider as more than a subspecies. It is most decidedly not related to *lobatus* Esch. as was indicated by Schwarz in Wytsman's Genera Insectorum. A simple reading of the original description would show that it is closely related to *volitans*. The rare *vulneratus* (Lec.) of Maine and the Allegheny Mountains, I also consider as but a subspecies of *volitans*. I collected a specimen on Mt. Mitchell, North Carolina, which has been carefully compared with LeConte's type. It is in shape much like a typical *volitans*, slightly narrower, of a piceous bronze color with the sides of prothorax and legs rufous.

Ludius lobatus Eschscholtz

This species has been misunderstood, perhaps, to a greater extent than have any of the other species of the genus. The typical *lobatus* was described from Unalaska, Alaska, where it is fairly common. It is plumbeous in color, rather robust and fairly convex. *Ludius caricinus* Germ. with Sitka as the type locality is perhaps a little less convex but otherwise so similar to *lobatus* that it cannot readily be distinguished, therefore is not worthy of being listed even as a subspecies. The form *lobatus* extends from the Aleutian Islands, along the south side of the Alaska peninsula and throughout southeastern Alaska. In British Columbia, the specimens show a tendency to become flatter, narrower and more elongate and this form continues south through western Washington and Oregon and as far south as middle California where the most extreme forms are to be found. This was described as *moerens* Lec. and is so different that it should be listed as a subspecies even though in its territory fairly typical specimens of *lobatus,* particularly females, are to be found. In the San Francisco bay region, a form like *moerens* but somewhat blacker and with the base of the elytra orange is to be found. This is *xanthomus* Horn, little more than a color variety of *moerens.* From Plumas County, I have a series with the elytra entirely yellow, the extreme of the color tendency. In Alberta, Canada, and ranging eastward through Manitoba to New Brunswick and the Adirondack Mts. of New York, we have a small phase of *lobatus* which is moderately depressed, sometimes much like the less elongate forms of *moerens* in form and generally quite variable in color, plumbeous to forms with all yellow elytra. This depauperized form I am calling the subspecies **pygmæus** and designating as the holotype (No. 3178, Mus. Calif. Acad. Sci.), a piceous specimen from **Awene, Manitoba,** collected by Mr. E. Criddle. A similar colored paratype will also be designated. The well known *tarsalis* Melsh. of the northeastern part of America, I also consider as but a subspecies of the widely distributed and variable *lobatus.* This last mentioned form is more generally elongate than any of the forms except *moerens* and more convex than any except the typical *lobatus.* It is also very variable in color.

Ludius tahoensis Van Dyke, new species

Medium sized, elongate, subcylindrical, piceous black, somewhat dull, the anterior margin and sides of pronotum as well as propleuræ rufous, sometimes the hind angles of prothorax as well as epipleuræ and legs more or less rufous, and clothed with a few, short, scattered cinereous or slightly fulvous hairs. Head rather evidently, triangularly impressed between the eyes, coarsely, closely, somewhat confluently punctured and with a few, irregular callosities; antennæ reaching one segment beyond hind angles of prothorax in males and about hind angles in females, the second segment short though longer than broad, the third elongate, just perceptibly longer than fourth and not quite twice as long as broad, segments 3-10 elongate serrate and gradually diminishing in length and breadth towards apex. Prothorax slightly longer at middle than broad, hind angles rather robust and prolonged, more triangular and backward-projecting in males, somewhat narrowed and more divergent in females, blunt at apices and with distinct carinæ near the margin, sides almost straight and but slightly convergent to near apex in males, distinctly arcuate in females; the disk moderately convex and rather coarsely, closely, uniformly punctured, more coarsely, umbilicately, closely and somewhat cribrately punctured laterally, not evidently canaliculate at middle; scutellum subcordate, finely punctured and pubescent. Elytra distinctly over twice as long as prothorax and twice as long as broad, with sides but slightly divergent and arcuate to posterior third, the disk convex, the striæ well impressed and very finely punctured, the intervals slightly convex and distinctly though irregularly biserially punctured. Beneath rather coarsely, closely punctured on prosternum, very closely on propleuræ, and finely, more sparsely punctured on abdomen. Male, length 11 mm., breadth 3 mm.; female, length 13 mm., breadth 4.5 mm.

Holotype: Male, No. 3179; and *Allotype:* Female, No. 3180, Mus. Calif. Acad. Sci., and five *Paratypes,* the first and second collected by me near **Fallen Leaf Lake,** July 8, 1915, and Tallac, June 1899, both near Lake Tahoe, Calif., the paratyes all from the same general neighborhood.

This species in size, coloration and general appearance resembles the well known *Agriotes fucosus* (Lec.). In shape it also resembles *Ludius furtivus* (Lec.) and others of the elongate, subcylindrical form, but is apparently not closely related to any of the known species of the genus to which it belongs.

Ludius atropurpureus (Melsheimer)

This rather attractive and uncommon species is much like our more common *furtivus* (Lec.) of the northwest and probably of the same ancestry. It is generally shorter and blunter, with the hind angles of the prothorax broader, the elytral striæ deeper and the punctures coarser, and the antennæ shorter, the third segment quite definitely serrate, not subcylindrical as in the latter.

Ludius limoniiformis (Horn)

Ludius limoniiformis (Horn) seems to stand apart, resembling in some aspects *monticola* (Horn), but in shape and general appearance simulating a *Limonius* more than anything else. It seems to be rather widely spread in the country to the west of the Great Lakes.

Ludius opaculus (LeConte)

This small species with more or less fulvous elytra and opaque appearance is moderately common at times in the more open places in the forest from middle California to British Columbia. It shows a color relationship with no other. *Diacanthus serricornis* Mann. is probably this species.

Ludius appressus (Randall)

This well known and robust species is one of the most isolated of our species. Its general shape and color pattern would seem to place it near *cruciatus* (Linn.) but it shows no structural resemblances.

Ludius angusticollis (Mannerheim)

Much confusion has existed concerning this well known elongate species of Alaska and our Northwest. The typical species has robust and triangular hind angles to the prothorax and is restricted to southeastern Alaska. In British Columbia and Washington its place is taken by a form having the angles much narrowed but otherwise not different. This is *fraternus* (Lec.) which I consider as nothing but a subspecies. In the high northern Cascades as on Mt. Rainier, Wash., and extending south to Mt. Hood, Oregon, there occurs a color phase of the latter with bright rufous or orange elytra. *Corymbites spectabilis* Mann. seems to be but a large female of the typical *angusticollis*.

Ludius sagitticollis Eschscholtz

In this species there is far more variation than is generally realized. The usual black forms with orange red elytra, short second and third antennal segments, and sharp, divergent hind angles to prothorax are readily recognized. I, however, have an all-piceous specimen from the Yellowstone National Park, and have seen several females which have the third antennal segment about as long as the fourth, thus out of place in the usual table.

Ludius rainieri Van Dyke, new species

Somewhat narrow and much elongated, flattened, light reddish brown, the body including head and prothorax sparsely clothed with fine pubescence, the elytra sparsely clothed with very short and minute hair. Head broadly sulcate between the eyes and rather definitely punctured, the punctures coalescing into radially arranged striæ anteriorly in the sulcus, a definite crista in front of each eye and about the antennæ; antennæ filiform, almost reaching the middle of the elytra, the second and third segments short though longer than broad and together shorter than fourth, the latter about three times as long as broad and about equal in length to each of the following four though slightly more robust. Prothorax longer than broad, hind angles prominent, acute and slightly diverging, with a fine though long carina on each, the sides from bases of hind angles almost straight or slightly sinuous and converging to apex, the side margin fine, the disk somewhat convex, rather finely, closely punctured and with a well defined impression each side and in front of middle. Scutellum elliptical, slightly concave, and finely punctured and pubescent. Elytra broader at base than prothorax across tips of hind angles, about three times as long as broad, gradually narrowing posteriorly, the disk moderately convex, the striæ finely but in most cases not sharply defined and finely and obscurely punctured, the intervals flat, finely but not distinctly punctured and finely rugose, giving the elytra a dull aspect. Prothorax beneath coarsely, closely punctured, sternum somewhat longitudinally cristate at middle in front of coxæ and concave laterally, spine semicircularly arched and sulcate between coxæ, afterbody rather finely and moderately closely punctured, legs very long. Length 16 mm., breadth 4 mm.

Holotype: Male, No. 3181, Mus. Calif. Acad. Sci., with antennæ somewhat injured, in my collection, from **Mt. Rainier, Wash.** A second specimen, I have seen in the collection of Prof. W. J. Chamberlin at Corvallis, Oregon.

This insect is of about the same length, breadth and color as *pyrrhos* (Hbst.) though it differs in its proportions and general appearance, in this regard looking more like one of the larger species of *Aplastus*. Such peculiarities as its type of antennæ, frontal carinæ, type of pronotum and prosternum should enable this odd species to be readily recognized.

Ludius nunenmacheri Van Dyke, new species

Rather small, moderately expanded and flattened, black, pronotum orange red except for an irregular V-shaped black marking extending forwards on the disk from near the base, propleuræ, prosternal lobe and elytra yellow, the latter with suture and a diamond shaped area at apex black, mouthparts, two basal segments of antennæ, tibiæ and tarsi testaceous, the surface sparsely clothed with fine, fulvous pile, semi-erect on elytra. Head convex above, flattened in front and sparsely though definitely punctured; the antennæ but slightly serrate and extending about a segment beyond hind angles of prothorax in males and almost to angles in females, the second and third segments small though longer than broad, fourth segment about equal to the preceding two together, the following gradually shorter and narrower. Prothorax about one-fourth longer than broad, spatulate, hind angles well marked, acute, slightly divergent and with carinæ fine and close to margin, the sides almost straight and gradually diverging from base of hind angles to anterior third then broadly rounded to apex, the disk moderately convex, without median canaliculation and rather finely, regularly and not closely punctured. Scutellum elongate-cordate and finely punctured and pilose. Elytra broader at base than prothorax, over twice as long as broad, gradually arcuately widening from base to posterior third then narrowing to apex, disk moderately convex, striæ finely impressed and closely, finely punctured, the intervals flattened and very finely punctured. Prothorax beneath finely and sparsely punctured, hind body very finely but more closely punctured, prosternal sutures double. Length 8.5 mm., breadth 2.5 mm.

Holotype: Male, No. 3182; and *Allotype:* Female, No. 3183, Mus. Calif. Acad. Sci., and one *Paratype* in my collection, received from Mr. F. W. Nunenmacher who collected them in western **Siskiyou Co., Calif.**, June 2, 1911. This pretty little species of course varies somewhat as regards its color pattern. The V-shaped discal mark of the pronotum may be quite faint as in my allotype, the sutural black line of the elytra may disappear, and the apical spot may be much reduced in size.

The species is widely separated in the table from its close relatives. It really belongs with *sulcicollis* (Say) and its associates, all of which are strictly lignivorous. The size, color pattern and characters given should enable it to be readily recognized when found.

Ludius trivittatus (LeConte)

This conspicuous and easily recognized species seems to have been omitted by Schenkling from his catalogue in Junk's Coleopterorum Catalogus. Though widely separated in the key because of the length of the third antennal segment, it is in reality of the same stock as *semivittatus* (Say) and *fusculus* (Lec.) from the Pacific Coast of our country.

Ludius shastensis Van Dyke, new species

Moderately elongate, subparallel and subcylindrical, the head, antennal segments 4-11, pronotal disk and prosternum, meso- and metasternum and first abdominal segment black, the remaining portions of body rufous, and clothed with coarse though sparsely placed fulvous pile. Head convex, coarsely, closely, cribrately punctured; antennæ moderately serrate, reaching three segments beyond hind angles of prothorax, second segment small, little longer than broad, third about a third longer, subcylindrical and about three-fourths length of fourth, fourth about one-third longer than broad, segments 4-10 distinctly triangular, gradually narrower and just perceptibly shorter. Prothorax slightly longer than broad, hind angles narrow, distinctly divergent, the sides practically straight from bases of hind angles and slightly convergent almost to apex where rounded; disk convex, moderately coarsely but not closely punctured except at sides, median canaliculation but vaguely indicated posteriorly. Scutellum subcordate, finely punctured and pubescent. Elytra broader at base than breadth of prothorax across apices of hind angles, about twice as long as broad, disk convex, the striæ well impressed and rather coarsely, closely punctured, the intervals convex behind, somewhat flattened basally, finely punctured and rugose. Beneath the propleuræ are rather coarsely, closely punctured, the remainder finely, rather sparsely punctured. Length 10 mm., breadth 3.5 mm.

Holotype: Male, No. 3184, Mus. Calif. Acad. Sci., a unique in my collection, collected by Mr. F. W. Nunenmacher in **Shasta Co., Calif.**

This rather inconspicuous species is related to *blaisdelli* but readily separated as is pointed out in the discussion of that species.

Ludius insidiosus (LeConte)

This species has a much more extensive range than has generally been believed. It is now known to range throughout the higher parts of the entire Appalachians and from Maine and eastern Canada to British Columbia and Montana. *Corymbites lutescens* Fall is but the lighter, more western race of the species.

Ludius blaisdelli Van Dyke, new species

Moderately elongate, subparallel and subcylindrical, black, the basal segment of antennæ and elytra rufous, the legs rufotestaceous in the female, the apical, side margin and propleuræ of prothorax and posterior abdominal segments also somewhat rufous, and rather evidently clothed with short cinereous (male) or fulvous (female) pile. Head flattened, coarsely, closely, cribrately punctured; antennæ moderately serrate, reaching several segments beyond hind angles of prothorax in male and to hind angles in female, the second segment short, but about a third longer than broad, the third one-third longer, subcylindrical and but little shorter than the fourth, the last a third longer than broad, the following gradually narrower. Prothorax slightly longer than broad in male, diameters about equal in female, hind angles robust and but slightly divergent, the sides almost straight in male or slightly arcuate in female from hind angles, and slightly convergent to near apex where rounded; the disk convex, coarsely, closely and especially in female cribrately punctured, with well marked median canaliculation from base to middle. The scutellum broadly cordate, finely punctured and pilose and longitudinally impressed in female. Elytra about as broad at base as prothorax, more than twice as long as broad, convex, the striæ finely impressed and rather coarsely, closely punctured, the intervals flat, finely punctured and rugose. Beneath with propleuræ rather coarsely, closely punctured, the prosternum to a lesser degree and the afterbody finely and less closely punctured. Male, length 10 mm., breadth 3.25 mm.; female, length 14 mm., breadth 4.75 mm.

Holotype: Male, No. 3185; and *Allotype:* Female, No. 3186, Mus. Calif. Acad. Sci., in my collection, both collected by me in **Lagunitas Cañon, Marin Co., Calif.**, the first, April 7, 1907, the second March 29, 1908.

As stated previously, this species is no doubt related to *shastensis* but it differs from that in regard to the proportionate lengths of the second and third antennal segments, the more robust and hardly divergent hind angles of prothorax, narrow and markedly divergent in *shastensis,* the much coarser and closer pronotal punctation and pronounced canaliculation, and the finer elytral striæ and flattened intervals. It, like *shastensis,* is exceedingly rare, the specimens mentioned being the only ones that I have seen. It is named in honor of my good friend, Dr. F. E. Blaisdell, in remembrance of many collecting trips taken together to the region where it was secured.

Ludius falsificus (LeConte)

Ludius falsificus (Lec.) and *Ludius angularis* (Lec.) are but eastern and western representatives of the same species. I have large series of the second from British Columbia and the more mountainous parts of the Pacific States and these typical *angularis,* as shown by critical comparison with the type, cannot be distinguished with any degree of certainty from typical *falsificus* from Maine or New Brunswick. It is in fact but one species which extends along our northern border from the Atlantic to the Pacific as well as throughout the high mountains of the Pacific Coast. On the coast of Oregon as at Cannon Beach, there is a very dark piceous phase of the above, a typical melanotic wet-belt color phase.

Ludius resplendens Eschscholtz

The typical phase of this species extends with slight variations from Alaska across the continent to the Atlantic and into the high mountains of New England and northern New York. It also extends south along the Cascades and very high Sierra Nevada Mountains and into the Rocky Mountains. These more southern specimens are generally shorter, duller and more coppery than the typical form. They are what was described as *Corymbites breweri* Horn from the high middle Sierra Nevadas. Large series show that they grade gradually into the typical *resplendens.* I have therefore placed it as but a subspecies of the latter.

Ludius appalachius Van Dyke, new species

Elongate, narrow, but moderately convex, shining, dark coppery bronze, the cupreous color most evident on head, prothorax, suture and margins of elytra and beneath, the surface sparsely, though evidently, clothed with fine white pile. Head slightly convex, coarsely yet not closely punctured; antennæ slightly serrate, not quite reaching hind angles of prothorax, second segment about twice as long as wide and two-thirds the length of third, the latter subcylindrical and barely longer than fourth. Prothorax including angles longer than broad, broadest and subangulate behind middle, the sides sinuate posteriorly and almost straight and convergent anteriorly, the posterior angles prominent, subacute, distinctly divergent and incurved at apices, and with well marked carinæ; the disk moderately convex, with median canaliculation faintly impressed at base, and distinctly but not coarsely or closely punctured except laterally. Scutellum flat and finely punctured. Elytra more than twice as long as prothorax and twice as long as broad, distinctly narrowed, posteriorly and moderately convex, the striæ finely but not always clearly impressed and finely, closely punctured, the intervals flattened or barely convex and finely, somewhat obscurely and sparsely punctured. Beneath the prosternum is shining, rather coarsely and sparsely punctured, the propleuræ finely and very closely punctured giving the surface a granular appearance, and the afterbody finely and sparsely punctured. Length 13 mm., breadth 4 mm.

Holotype: Male, No. 3187, Mus. Calif. Acad. Sci., and one *Paratype* in my collection, the first collected by me on **Mt. Mitchell, North Carolina,** June 1902, the second taken by Mr. Wm. Beutenmueller, July 12, 1912, on the Black Mts. of North Carolina. A third quite typical specimen bearing the label Big Indian Valley, Catskill Mts., N. Y., June 18, 1910, was submitted to me for study by Mr. Charles Schaeffer.

This species has the general facies of a dark specimen of *Ludius resplendens* Esch. and probably comes from the same general stock. It, however, has certain definite features which readily separate it, such as the generally narrower prothorax, broadest behind the middle, the more attenuate elytra, the very evident though sparse pilosity over the entire body, and the very fine and close punctation of the propleuræ contrasting with the coarse and but moderately close punctation of *resplendens.*

Ludius weidti (Angell)

This very rare species which ranges from the higher mountains of British Columbia through the Cascades at least as far south as Mt. Rainier, Wash., can always be readily separated from *resplendens* by its smaller size, much shorter body, fine and sparsely punctured pronotum and very flat elytral intervals. My Mt. Rainier specimens are a brilliant green but I have received others from Mt. Garibaldi, B. C., from Mr. G. A. Hardy, which are a deep blue color.

Ludius divaricatus (LeConte)

The female of this well defined species is without doubt, the *Corymbites crassus* Lec. as first definitely pointed out by Blanchard.[25] Horn[26] unfortunately misquoted him, stating that he said it was the female of *inflatus* (Say). I have a typical *crassus* which I collected in North Carolina along with a large series of *divaricatus* and which has been carefully compared with LeConte's type. *Ludius inflatus* (Say) is perhaps the most widely distributed species of the genus in North America, especially common in all of the Pacific States where the females are about as well known as are the males and not to be distinguished from them except by their generally larger size, more robust appearance and slightly shorter antennæ. They are very distinct from *crassus* in almost every regard.

Ludius rupestris (Germar)

This species has a most interesting distribution, extending from Victoria through British Columbia to the northern part of the Great Basin thence south through this to northern Arizona and ranging east, and west from the Wasatch Mts. of Utah to the Cascades and Sierra Nevadas. It is truly a Great Basin species. I have seen only two specimens, taken on the western flanks of the Sierra Nevadas, both in Sequoia National Park.

Ludius rotundicollis (Say)

This species is to be found on both sides of the continent, the more typical phase in the East. The subspecies *nigricans* (Fall) is a bit larger and generally with the pronotum more heavily punctured. It ranges throughout western Washington and Oregon and south along the high Sierra Nevada. The subspecies *diversicolor* (Esch.) is more like the typical form in size and punctation but with the prothorax, except its margins, of a bright red color, both above and below. This is a lowland form, found generally in the late summer or autumn in the San Francisco Bay region and generally around old live oaks in the rotting parts of which it breeds. In various parts of California as near Monterey, as well as farther north in Washington and in the Sierras, *diversicolor* has a black median longitudinal stripe or band on the pronotum as well as a black prosternum.

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[25] Ent. Amer., 5, 1889, p. 140.
[26] Ent. News, 1, 1890, p. 55.

Ludius rotundicollis (Say) with *sulcicollis* (Say), *rupestris* (Germ.) and my *nunenmacheri* form a peculiar group within the genus characterized by double prosternal sutures, a prothorax broadly expanded in front of the middle, less evident in most *rotundicollis,* and strictly lignivorous habits as larvæ.

Ludius fusculus (LeConte)

The type of this species is much bleached, no doubt as a result of having been collected in alcohol and this allowed to gradually evaporate. As a result it does not look at all like freshly caught specimens which are very black and when perfect about as densely clothed with coarse gray pile as is *inflatus* (Say). It is very closely related to *semivittatus* (Say) and may prove to be but a melanotic phase of that, as I have found is the case with *leucaspis* (Germ.) as compared with *umbripennis* (Lec.). The distribution also somewhat parallels that, for *fusculus* is most often found in the northern Great Basin as in western Alberta, eastern British Columbia and Washington, and extending south through the more inland parts of California as far as the San Francisco Bay region, where, however, it is very rare. Many species which range from the Rocky Mountains through the northern Great Basin to the Pacific seem to have melanotic phases in this hot and dry intermountain area.

Ludius semivittatus (Say)

For a time I believed that this species had a discontinuous distribution, being found along the eastern flanks of the Colorado Rocky Mountains (type locality) and along the coast of middle California. I, however, have a specimen from Wyoming and we have records that it has been taken in Oregon and British Columbia. It appears to extend from British Columbia in two directions, through the northern Great Basin and Wyoming to the eastern foothills of the Rocky Mountains in Colorado and down the Pacific Coast within a few miles of the ocean, to middle California. Possibly the all-black *fusculus* as stated above, is the form that bridges the gap in the north. The Colorado and Wyoming specimens are rather small, those about San Francisco somewhat larger while many of those from near Santa Cruz and northern Sonoma Co., are often of good size with the yellow markings much reduced. I believe that the *oblongoguttatus* (Mots.) is one of these. The description fits nothing else and these are found in the territory from whence Motschulsky secured most of his Elateridæ. The Japanese *vagepictus* Lewis is also very closely related to *semivittatus*.

Ludius morulus (LeConte)

This black species ranges from the Yukon Valley in Alaska southeast to eastern British Columbia, Alberta, and the states to the south of them. I have a specimen from Mt. Rainier, Wash., in which the sides of the prothorax are partly red.

Ludius cruciatus (Linnæus)

Ludius cruciatus (Linn.) may be fairly stable as to appearance in the Old World and in northeastern America but it is most variable in northwestern America. In eastern British Columbia, specimens are often found with vittate elytra, the black sutural and humeral vitta extending to the apices with the cross bars absent, or the elytra may be unicolorous without any black markings at all. In the northwest generally, particularly in the northern Cascades, the usual color type is to be met with but in the southern Cascades and Sierra Nevada Mountains an entirely black phase appears, which I am calling the subspecies **ater** and designating as a holotype (No. 3188, Mus. Calif. Acad. Sci.), a specimen from **Red Mt., Nevada Co., Calif.**, collected by Chs. Von Geldern, July 3, 1911. Intermediates such as the variety *edwardsi* (Horn) with the prothorax margined with red and with yellow patches near the base of the elytra, sometimes occur, but the usual intermediate has entirely black elytra. An unusual phase is also represented in my collection by a specimen from Meadow Valley, Plumas Co., which is like the typical phase, except that the entire apical half of the elytra is black.

Ludius carbo (LeConte)

The typical *carbo* of the Willamette Valley, Oregon, is of a sooty black color, robust and quite convex. As it ranges eastward towards Utah and south into California it becomes flatter, and in the latter territory has the elytra somewhat metallic. The variety *lateralis* (Lec.) with the sides of the prothorax somewhat rufous is generally found with the typical form. In the middle and southern Sierras of California, this color phase becomes the dominant form only here it is much flattened. not very convex as in the north, and with the elytra as previously stated submetallic. This phase is sometimes very hard to separate from the intermediate phase of *cruciatus* but a proper attention to details will enable it to be done.

Ludius pruininus (Horn)

The typical form of this is almost equal in size to the normal form of the preceding and ranges from Utah west to the middle Sierras of California. Farther north in the Great Basin in eastern Oregon and Washington and the lava beds of northeastern California, it becomes smaller, more depauperized, and a trifle less coarsely sculptured. This is the subspecies *noxius* Hyslop, a form which has become well known as a result of the injury which its larvæ do to crops.

Ludius æreipennis (Kirby)

This is a wide ranging and common though very attractive species. The typical form in eastern Canada and the adjacent states to the south has the elytra very finely punctured and is more apt to be of a bronze color. The subspecies *tinctus* (Lec.) with the elytra more evidently punctured gradually replaces that as one approaches the Pacific. In western British Columbia and Washington it is large, with the elytra brilliantly metallic green or cupreous, but in the high southern Cascades and Sierra Nevadas as well as in the Rocky Mountains, it becomes smaller and generally of a deep violet bronze. In Manitoba, Alberta, eastern British Columbia and the adjacent states to the south, very small or depauperized forms are commonly to be met with. These are often 9 mm. or less in length and quite dull in appearance. In western Canada this species is also rated as quite destructive.

Ludius suckleyi (LeConte)

This species is generally considered quite stable as it is somewhat local, yet it has an all black phase found near **Olympia, Wash.** This I am calling the subspecies **olympiæ** and designating one of my specimens as the *holotype* (No. 3189, Mus. Calif. Acad. Sci.). My specimens were received from my very dear friend, the late Prof. O. B. Johnson of the University of Washington.

Ludius leucaspis (Germar)

Extensive field work has been necessary in order to clear up the status of this species. The typical all black specimens dwell in eastern Washington and Oregon and extend across the Great Basin to Utah. At higher elevations in the Wasatch Mountains of Utah, a phase appears with a light subapical elytral patch, and with the elytral margins sometimes light. In western British Columbia, Washington and Oregon, the well known subspecies *umbripennis* (Lec.) appears. This has yellow elytra ornamented with black sutural and humeral vittæ, the former enlarged just back of the scutellum and the latter dilated sub-basally as well as postmedially. Farther east in the Cascades and northern Sierra Nevada Mountains, the elytral markings change from vittæ to transverse bars or closely simulate the markings of typical *cruciatus*. The simulation to the latter is also often heightened by their having the sides of the prothorax also reddish. A good series of these last show that they gradually grade on one hand into the coastal *umbripennis* and on the other into the typical *leucaspis*.

Ludius conjungens (LeConte)

This species throughout the greater part of California and most of its area of distribution is of the normal type, black or piceous, of moderate size, 10-12 mm. in length, rather flattened, the pronotum regularly though not closely punctured and the elytral intervals between the rows of punctures smooth and even. In the Sierra Nevada Mountains, variations appear. In Placer Co., specimens with red legs may occur. Farther south in Mariposa Co., the specimens become more convex as well as more generally robust, the prothorax, generally the head as well and often most of the underside of the body, a bright red. This is the variety *lecontei* (Cand.). A similarly colored specimen from Mt. Saint Helena in Sonoma Co., has also been seen, but the more flattened form of this is that of the typical *conjungens*. In the southern Sierras as in the Sequoia National Park, the specimens retain their robust form, are colored much as in the variety *lecontei* but have the pronotum very closely, approximately, and coarsely punctured and the elytra rugose as well as punctate. This extreme is the subspecies *obversus* (Horn).

Ludius nigricollis (Bland)

This species which is rather uncommon, is most often confused with the large western forms of *propola* because of its somewhat similar color pattern. It is always more narrowed both anteriorly and posteriorly, with the antennæ longer and the third antennal segment much shorter than the fourth, the prothorax proportionally longer with the hind angles unicolorous with the rest of the prothorax or only faintly lighter apically. It is found from Marquette, Mich., to eastern British Columbia, south into the northern Rocky Mountains and along the east flank of the Cascades and Sierra Nevada Mountains as far south as Bishop, California.

Ludius candezei Leng

This pretty little flattened species, black with yellow elytra, having a large cordate black apical patch and densely pilose, is very rare. The only specimens that I have seen were taken near Lake Tahoe, California.

Ludius mirabilis (Fall)

This is a most attractive little species, somewhat suggesting *fallax* but much smaller, blunter, the prothorax broad and deeply sinuate before the sharp and very divergent hind angles, and clothed with beautiful golden pile. The prothorax is generally reddish brown though it may be quite black. It ranges through the Sierra Nevada Mountains from the Yosemite Valley to Sequoia National Park and in the south is most often beaten from *Fremontia californica,* in the brilliant yellow flowers of which it sometimes feeds. It is never common.

Ludius propola (LeConte)

On the Pacific Coast, this species is common and of fair size, 12–14 mm. in length, but in the very high mountains and in the eastern portion of its range we have depauperized forms which average about 8 mm. in length. The color pattern of the elytra also varies greatly even within the same territory. Careful studies of the LeConte types have convinced me that *propola, furcifur,* and *nubilus* are but slight color variations of one species.

Ludius triundulatus (Randall)

As stated by Fall in 1907, his *tigrinus* is but the large Pacific Coast phase or subspecies of *triundulatus*. The variety *nebraskensis* Bland is but a race in which the color pattern of the elytra is almost obliterated. Among the numerous specimens taken in the Rocky Mountain region we may occasionally find a specimen which answers the description of this.

Ludius hoppingi Van Dyke, new species

Short, flattened, black, the elytra straw yellow, and moderately densely clothed with short, fine, fulvous pile. Head slightly convex, finely, closely punctured; antennæ fine, slightly serrate, and about reaching hind angles of prothorax, second segment small, third subcylindrical, about twice the length of second and almost as long as fourth. Prothorax a bit longer than broad, slightly convex, the sides sinuate in front of hind angles, thence arcuate to apex, the hind angles short, broad, blunt at apex, without carinæ but with the outer margin much reflexed; the disk finely, closely punctured and with vague median canaliculation posteriorly. Scutellum finely punctured. Elytra slightly more than twice as long as prothorax and somewhat less than twice as long as broad, the lateral margins broad, sides slightly arcuate at middle and gradually arcuately narrowed to apex, the disk somewhat flattened, striæ finely impressed and finely, somewhat obscurely punctured, the intervals flat, very finely punctured and rugose. Beneath finely, closely punctured, the punctures of propleuræ shallow and approximate. Length 9.5 mm., breadth 3 mm.

Holotype: No. 3190, Mus. Calif. Acad. Sci., and *Paratype* in my collection, from **Revelstroke Mt., B. C.,** July 17, 1925, collected by Mr. Ralph Hopping, and several paratypes in the collection of Mr. Hopping. I also have another specimen collected by myself in Paradise Valley, Mt. Rainier, Wash., July 1905, and have seen another collected by Mr. R. E. Barrett at Lower Labarge, Yukon Terr., Canada, June 4, 1928.

This interesting little species superficially looks like a small and narrow *medianus*. It, however, lacks the robustness of the latter and the well marked carinæ of the hind angles of prothorax, the prothorax being far more suggestive of some of the flatter phases of *lobatus* and its associates. Its legs are black, yellowish in *medianus*, and the elytra more flattened and with much finer striæ.

Ludius (Paranomus) granicollis Van Dyke, new species

In size and general appearance similar to small specimens of *costalis* (Payk.), piceous with æneous lustre, the basal segments of antennæ, tibiæ and tarsi, epipleuræ, and in females the elytra with a basal spot and lateral margin with an approximate subhumeral spot and transverse subapical patch, testaceous. Head convex and finely, closely punctured; antennæ reaching well beyond hind angles of prothorax, second segment about twice as long as broad and approximately three-fourths length of third. Prothorax transverse, hind angles acute and slightly divergent, sides strongly sinuate in front of hind angles in male, less so in female, arcuate at middle and gradually narrowed to apex, the disk finely, closely and more or less regularly punctured over entire area. Elytra about four times the length of prothorax, slightly arcuate at sides in males, more broadly so in females, the disk with striæ vaguely defined at center as usual in subgenus *Paranomus* and finely, moderately closely punctured. Beneath rather finely and sparsely punctured.

Holotype: Male, No. 3191; and *Allotype:* Female, No. 3192, Mus. Calif. Acad. Sci., and six *Paratypes* collected by myself in **Paradise Valley, Mt. Rainier, Wash.,** July 14-31, 1905. I have also taken it in the Yakima Indian Forest Reservation, Mt. Adams, Wash., June 30 and July 1, 1925, and on Mt. Hood, Oregon, June 25, 1925.

This species resembles *estriatus* (Lec.) as regards the small male prothorax and antennæ but differs from this as well as from *costalis* (Payk.) by the much finer and closer punctation of head and pronotum which gives them a granular appearance.

BIBLIOGRAPHY

Ludius virens (Schrank) (Elater), Berl. Ges. Nat. Freunde, II, 1781, p. 317.
  æneicollis (Oliv.) (Elater), Jour. Hist. Natur., I, 1792, p. 264, t. 14, f. 3; (Corymbites), Cand., Mon. Elat., IV, 1863, p. 94.
  castaneus (Scop.) (Elater), Ent. Carn., 1763, p. 93.
  signatus (Panz.) (Elater), Fn. Germ., 1801, nr. 5, p. 77.
  virescens (Gmel.) (Elater), *in* Linn. Syst. Nat., ed. 13, IV, 1789, p. 1906.
  kendalli (Kirby) (Ctenicerus), Faun. Bor. Am., IV, 1837, p. 149, pl. II, fig. 7; Lec., (Corymbites), Tr. Am. Phil. Soc., X, 1853 (n. s.), p. 444, 33.
  anchorago (Rand.) (Elater), Boston Jour. Nat. Hist., II, 1838, p. 5.

Ludius vernalis (Hentz) (Elater), Jour. Acad. Nat. Sci. Phila., V, 1827, p. 374, t. 13, f. 2; Say, Tr. Am. Phil. Soc., VI, 1836, p. 172; Germ., (Corymbites), Zeits. f. d. Ent., IV, 1843, p. 56; Lec., Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 444, Cand., Mon. Elat., 1863, p. 101; Blatchley, Col. Ind., 1910, p. 763, f. 290.

Ludius sjaelandicus (Miller) (Elater), Fn. Fried., 1764, p. 21.

‖*tessellatus* (Fab.) (*nec.* Linn.) (Elater), Syst. Ent., 1775, p. 211; Cand., (Corymbites), Mon. Elat., IV, 1863, p. 104.

nubilus (Schrank) (Elater), Bayersche Reise, 1786, p. 46.

viridis (Say) (Elater), Ann. Lyc. Nat. Hist. N. Y., I, 1825, p. 255.

cuprascens (Lec.) (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 444.

Ludius cribrosus (Lec.) (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 443, Cand., Mon. Elat., IV, 1863, p. 107; Schenkling, *in* Junk's Col. Cat., Pars. 88, 1927, p. 391.

subcanaliculatus (Mots.) (Pristilophus), Bull. Mosc., XXXII, 1859, IV, p. 375; Schwarz (Corymbites), *in* Wytsman, Gen. Ins., fasc. 46, 1907, p. 224.

maurus (Lec.) ♀ (Corymbites), Tr. Am. Phil. Soc., X, 1853, p. 444; Cand., Mon. Elat., IV, 1863, p. 182; Schenkling, *in* Junk's Col. Cat., Pars. 88, 1927, p. 395.

Ludius cribrosus var. colossus (Lec.) ♀ (Corymbites), Tr. Am. Phil. Soc., X, 1853, p. 444; Cand., Mon. Elat., IV, 1863, p. 184; Schenkling, *in* Junk's Col. Cat., Pars. 88, 1927, p. 394.

? Ludius cribrosus var. rufipes (Mots.) (Corymbites), Bull. Mosc., XXXII, 1859, p. 377.

Ludius signaticollis (Melsh.) (Diacanthus), Proc. Acad. Nat. Sci. Phila., II, 1846, p. 216; Lec., (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 443; Cand., Mon. Elat., IV, 1863, p. 113; Blatchley, Col. Ind., 1910, p. 764; Schenkling, *in* Junk's Col. Cat., Pars. 88, 1927, p. 392.

Ludius uliginosus n. sp.

Ludius obscurus (Lec.) (Corymbites), Tr. Am. Phil. Soc., (n. s.), X, 1853, p. 442; Cand., Mon. Elat., IV, 1863, p. 107; Schenkling, *in* Junk's Col. Cat., Pars. 88, 1927, p. 392.

Ludius silvaticus n. sp.

Ludius protractus (Lec.) (Corymbites), Proc. Acad. Nat. Sci. Phila., 1859, p. 85; Cand., Mon. Elat., IV, 1863, p. 108; Schenkling, *in* Junk's Col. Cat., Pars. 88, 1927, p. 392.

Ludius protractus var. jouteli (Dow) (Corymbites), Bull. Brookl. Ent. Soc., VIII, 1913, p. 77; Leng, (Ludius), Cat. Col., 1920, p. 169; Schenkling, *in* Junk's Col. Cat., Pars. 88, 1927, p. 392.

Ludius aplastoides n. sp.

Ludius anthrax (Lec.) (Corymbites), Proc. Acad. Nat. Sci. Phila., 1861, p. 348; Cand., Mon. Elat., IV, 1863, p. 184; Schenkling, *in* Junk's Col. Cat., Pars. 88, 1927, p. 394.

Ludius atlas, n. sp.

Ludius dolorosus n. sp.

Ludius fulvipes (Bland) (Corymbites), Tr. Ent. Soc. Phila., I, 1863, p. 354.

Ludius exilis Notman, Jour. N. Y. Ent. Soc., XXVIII, 1920, p. 30-31.

Ludius pyrrhos (Hbst.) (Elater), Käfer, X, 1806, p. 30, t. 160, f. 11; Say, Tr. Am. Phil. Soc., VI, 1836, p. 167; Lec., (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 447; Cand., Mon. Elat., IV, 1863, p. 108; Blatchley, Col. Ind., 1910, pp. 764, 767.

æqualis Melsh. ♀ (Athous), Proc. Acad. Nat. Sci. Phila., II, 1846, p. 153.

pyrrhicus Hald. ♀ (Athous), Proc. Acad. Nat. Sci. Phila., I, 1843, p. 303.

vagrans Melsh. (Athous), Proc. Acad. Nat. Sci. Phila., II, 1846, p. 153.

Ludius macer (Fall) (Corymbites), Tr. Am. Ent. Soc., XXXVI, 1910, p. 133.

Ludius tenellus n. sp.

Ludius jaculus (Lec.) (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 447; Cand., Mon. Elat., IV, 1863, p. 106.

teres (Lec.) ♀ (Corymbites), Proc. Acad. Nat. Sci. Phila., 1866, p. 392.

Ludius horni Schwarz, *in* Wytsman, Gen. Ins., fasc. 46, 1907, p. 316.

||*longicornis* (Horn) (nec. Boh.) (Corymbites), Tr. Am. Ent. Soc., III, 1870, p. 79.

Ludius patricius n. sp.

Ludius linearis (Fall) (Corymbites), Tr. Am. Ent. Soc., XXXVI, 1910, p. 132.

Ludius bivittatus (Melsh.) (Campylus), Proc. Acad. Nat. Sci. Phila., II, 1846, p. 215; Lec., (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 447; Cand., Mon. Elat., IV, 1863, p. 109; Blatchley, Col. Ind., 1910, pp. 764, 767.

Ludius humboldti n. sp.

Ludius trunculentus (Cand.) (Corymbites), Ann. Soc. Ent. Belg., XXXIII, 1889, p. 50.

Ludius volitans Esch., *in* Thon. Ent. Arch., II, 1, 1829, p. 34; Mann., (Diacanthus), Bull. Mosc., XVI, 1843, p. 261; Cand., (Corymbites), Mon. Elat., IV, 1863, p. 114.

Ludius volitans subsp. umbricola Esch., *in* Thon. Ent. Arch., II, 1, 1829, p. 34; Mann., (Diacanthus), Bull. Mosc., XVI, 1843, p. 242; Germ. (Corymbites), Zeits. f. d. Ent., IV, 1843, p. 65; Cand., Mon. Elat., IV, 1863, p. 115.

Ludius volitans subsp. spinosus (Lec.) (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 447; Cand., Mon. Elat., IV, 1863, p. 121.

Ludius volitans subsp. vulneratus (Lec.) (Corymbites), Smiths. Misc. Coll., VI, No. 167, 1863, p. 86.

Ludius rufipennis (Fall) (Corymbites), Tr. Am. Ent. Soc., XXXVI, 1910, p. 134.

Ludius lobatus (Esch.) (Elater), Entomogr., 1822, p. 69; Mann., (Diacanthus), Bull. Mosc., XVI, 1843, p. 243; Cand., (Corymbites), Mon. Elat., IV, 1863, p. 116.

caricinus (Germ.) (Corymbites), Zeits. f. d. Ent., IV, 1843, p. 63.

rudis (Mots.) (Corymbites), Bull. Mosc., XXXII, 1859, IV, p. 376.

telum (Lec.) (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 445.

Ludius lobatus subsp. tarsalis (Melsh.) (Athous), Proc. Acad. Nat. Sci. Phila., II, 1846, p. 157; Lec., (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 445; Cand., Mon. Elat., IV, 1863, p. 120; Blatchley, Col. Ind., 1910, pp. 763, 765.

Ludius lobatus subsp. pygmæus n. subsp.

Ludius lobatus subsp. moerens (Lec.) (Corymbites), Proc. Acad. Nat. Sci. Phila., 1866, p. 392.

Ludius lobatus var. xanthomus (Horn) (Corymbites), Tr. Am. Ent. Soc., III, 1871, p. 319.

Ludius elongaticollis (Ham.) (Corymbites), Can. Ent., XXV, 1893, p. 305.

Ludius tahoensis n. sp.

Ludius atropurpureus (Melsh.) (Corymbites), Proc. Acad. Nat. Sci. Phila., II, 1846, p. 215; Lec., Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 442; Cand., Mon. Elat., IV, 1863, p. 106.

Ludius limoniiformis (Horn) (Corymbites), Tr. Am. Ent. Soc., III, 1871, p. 320.

Ludius opaculus (Lec.) (Corymbites), Proc. Acad. Nat. Sci. Phila., 1866, p. 392.

? *serricornis* (Mann.) (Diacanthus), Bull. Mosc., XVI, 1843, p. 241.

Ludius appressus (Rand.) (Elater), Boston Jour. Nat. Hist., II, 1838, p. 11; Lec. (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 446; Cand., Mon. Elat., IV, 1863, p. 114.

mirificus (Lec.) (Corymbites), *in* Agassiz, Lake Superior, 1850, p. 228.

Ludius angusticollis (Mann.) (Diacanthus), Bull. Mosc., XVI, 1843, p. 241; Cand., (Corymbites), Mon. Elat., IV, 1863, p. 136.

spectabilis (Mann.) ♀ (Corymbites), Bull. Mosc., XXV, 1852, p. 328.

Ludius angusticollis var. fraternus (Lec.) (Corymbites), Ann. Mag. Nat. Hist., (4) IV, 1869, p. 379.

Ludius sagiticollis Esch., *in* Thon, Ent. Arch., II, 1, 1829, p. 34; Germ., (Pristolophus), Zeits. f. d. Ent., IV, 1843, p. 91; Mann., (Diacanthus), Bull. Mosc., XVI, 1843, p. 242; Cand., (Corymbites), Mon. Elat., IV, 1863, p. 135.

Ludius rainieri n. sp.

Ludius ochreipennis (Lec.) (Corymbites), Smiths. Misc. Coll., VI, No. 167, 1863, p. 85.

Ludius trivittatus (Lec.) (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 443.

Ludius shastensis n. sp.

Ludius insidiosus (Lec.) (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 448; Cand., Mon. Elat., IV, 1863, p. 122.

Ludius insidiosus var. lutescens Fall (Corymbites), Tr. Am. Ent. Soc., XXXVI, 1910, p. 134.

Ludius blaisdelli n. sp.

Ludius falsificus (Lec.) (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 448; Cand., Mon. Elat., IV, 1863, p. 122.

Ludius falsificus var. angularis (Lec.) (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 449; Cand., Mon. Elat., IV, 1863, p. 183.

Ludius mendax (Lec.) (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 448; Cand., Mon. Elat., IV, 1863, p. 183.

Ludius monticola (Horn) (Corymbites), Tr. Am. Ent. Soc., III, 1871, p. 319.

gracilis (Cand.) (Corymbites), Ann. Soc. Ent. Belg., XXX, 1889, p. 51; Horn, Ent. News, I, 1890, p. 54; Schwarz, *in* Wytsman, Gen. Ins., fasc. 46, 1907, p. 225.

Ludius furtivus (Lec.) (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 442; Cand., Mon. Elat., IV, 1863, p. 112.

Ludius cylindriformis (Hbst.) (Elater), Käfer, X, 1806, p. 93, t. 155, f. 9; Germ., (Corymbites), Zeits. f. d. Ent., IV, 1843, p. 64; Cand., Mon. Elat., IV, 1863, p. 110; Packard, Guide Study Insects, ed. 1870, p. 462; Blatchley, Col. Ind., 1910, pp. 764, 765.

appressifrons ♂ (Say) (Elater), Ann. Lyc. Nat. Hist. N. Y., I, 1825, p. 267; Harris, Ins. Inj. Veg., 1841; p. 49; Lec., (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 442; Emmons, (Ludius), Agr., N. Y., V, 1854, p. 88.

brevicornis (Say) ♀ (Elater), Ann. Lyc. Nat. Hist. N. Y., I, 1825, p. 265.

parallelipipedus Germ., ♀ Zeits. f. d. Ent., IV, 1843, p. 66.

submetallicus (Germ.) ♀ (Diacanthus), Zeits. f. d. Ent., IV, 1843, p. 72.

Ludius resplendens Esch., *in* Thon. Ent. Arch., II, 1, 1929, p. 34; Mann., (Diacanthus), Bull. Mosc., XVI, p. 241; Germ., (Corymbites), Zeits. f. d. Ent., IV, 1843, p. 60; Cand., Mon. Elat., IV, 1863, p. 103; Heyne, Tachenb., Exot. Käfer, 1908, p. 162, t. 25, f. 46.

ærarius (Rand.) (Elater), Boston Jour. Nat. Hist., II, 1838, p. 7; Lec., (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 441.

racinei (Chevr.) (Diacanthus), Rev. Mag. Zool., 1852, p. 578.

ab. *junki* (Schenk.) (Corymbites), Junk, Col. Cat., pars. 88, 1927, p. 392.

||*viridis* (Germ.) (nec. Say 1825) (Corymbites), Zeits. f. d. Ent., IV, 1843, p. 61.

Ludius resplendens subsp. breweri (Horn) (Corymbites), Tr. Am. Ent. Soc., III, 1871, p. 321.

Ludius appalachius n. sp.

Ludius weidti (Angell) (Corymbites), Ent. News, III, 1892, p. 84.

Ludius copei (Horn) (Corymbites), Tr. Am. Ent. Soc., III, 1871, p. 319; Blatchley, Col. Ind., 1910, pp. 764, 765.

Ludius divaricatus (Lec.) ♂ (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 446; Cand., Mon. Elat., IV, 1863, p. 112.

crassus (Lec.) ♀ (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 440; Cand., Mon. Elat., IV, 1863, p. 169; Blanchard, Ent. Amer., V, 1889, p. 140; Schwarz, *in* Wytsman Gen. Ins., fasc. 46, 1907, p. 222.

Ludius sulcicollis (Say) (Elater), Tr. Am. Phil. Soc., VI, 1836, p. 168; Lec. (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 441; Cand., Mon. Elat., IV, 1863, p. 133; Horn, Tr. Am. Ent. Soc., VII, 1878 (1879), Proc., p. XVI, Blatchely, Col. Ind., 1910, pp. 764, 768.

parallelus (Say) (Elater), Ann. Lyc. Nat. Hist. N. Y., I, 1825, p. 256.

Ludius rupestris (Germ.) (Corymbites), Zeits. f. d. Ent., IV, 1843, p. 66; Horn, Tr. Am. Ent. Soc., VII, 1878 (1879), Proc., p. XVI.

Ludius rotundicollis (Say) (Elater), Ann. Lyc. Nat. Hist. N. Y., 1825, p. 259; Lec., (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 440; Cand., Mon. Elat., IV, 1863, p. 168; Blatchley, Col. Ind., 1910, pp. 764, 767.

sticticus (Germ.) (Diacanthus), Zeits. f. d. Ent. IV, 1843, p. 74; Lec., (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 441.

Ludius rotundicollis var. russicollis (Germ.) (Diacanthus), Zeits. f. d. Ent., IV, 1843, p. 74; Lec., (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 444.

Ludius rotundicollis subsp. diversicolor Esch., *in* Thon, Ent. Arch., II, 1, 1829, p. 34; Cand., (Corymbites), Mon. Elat., IV, 1863, p. 180; Horn, Tr. Am. Ent. Soc., III, 1871, p. 323.

Ludius rotundicollis subsp. nigricans (Fall) (Corymbites), Tr. Am. Ent. Soc., XXXVI, 1910, p. 135.

Ludius nunenmacheri n. sp.

Ludius fusculus (Lec.) (Corymbites), Smiths. Misc. Coll., VI, No. 140, 1863, p. 48.

||*angustulus* Mots., Bull. Mosc., XXXII, 1859, p. 373.

Ludius semivittatus (Say) (Elater), Jour. Acad. Nat. Sci. Phila., III, 1823, p. 174; Tr. Am. Phil. Soc., VI, 1836, p. 168.

tristis (Cand.) (Corymbites), Mon. Elat., IV, 1863, p. 172; Cat. Elat., 1891, p. 173.

? *oblongoguttatus* (Mots.) (Prosternon), Bull. Mosc., XXXII, 1859, p. 373.

Ludius inflatus (Say) (Elater), Ann. Lyc. Nat. Hist. N. Y., I, 1825, p. 258; Tr. Am. Phil. Soc., VI, 1836, p. 174; Germ., (Diacanthus), Zeits. f. d. Ent., IV, 1843, p. 77; Lec. (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 438; Cand., Mon. Elat., IV, 1863, p. 163; Blatchley, Col. Ind., 1910, pp. 764, 767.

glaucus (Germ.) (Diacanthus), Zeits. f. d. Ent., IV, 1843, p. 76; Cand., (Corymbites), Mon. Elat., IV, 1863, p. 163; Leng, Cat. Col., 1920, p. 170, note 1.

simillisinus Mots., (Hadromorphus), Bull. Mosc., XXXII, IV, 1859, p. 374.

Ludius morulus Lec., (Corymbites), Smiths. Misc. Coll., VI, No. 167, 1863, p. 85; Horn, Tr. Am. Ent. Soc., III, 1871, p. 323.

Ludius morulus var. brunnipes (Bland) (Corymbites), Proc. Ent. Soc. Phil., III, 1864, p. 67; Cand., Cat. Elat., 1891, p. 169.

Ludius cruciatus (Linn.) (Elater), Syst. Nat., ed. 10, I, 1758, p. 404; Esch., (Ludius), *in* Thon, Ent. Arch., II, 1, 1829, p. 34, etc. Henshaw (Corymbites), List. Col., p. 71; Leng, (Ludius), Cat. Col., 1920, p. 170.

pulcher (Lec.) (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 440.

festivus (Lec.) (Corymbites), Rep. Surv. R. R. Route Miss. to Pac., XII, 3, 1857, p. 46; Horn, Tr. Am. Ent. Soc., III, 1871, p. 323.

Ludius cruciatus var. edwardsi (Horn). (Corymbites), Trans. Am. Ent. Soc., III, 1871, p. 324.

Ludius cruciatus subsp. ater n. subsp.

Ludius carbo (Lec.) (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 439; Cand., Mon. Elat., IV, 1863, p. 165; Horn, Tr. Am. Ent. Soc., III, 1871, p. 323.

Ludius carbo var. lateralis (Lec.) (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 439; Cand., Mon. Elat., IV, 1863, p. 164; Horn, Tr. Am. Ent. Soc., III, 1871, p. 323.

Ludius pruininus (Horn) (Corymbites), Tr. Am. Ent. Soc., III, 1871, p. 320.

||*pruinosus* (Schwarz) (Corymbites), *in* Wytsman, Gen. Ins., fasc. 46, 1907, p. 226.

pruinosulus (Schwarz) (Corymbites), *in* Wytsman, Gen. Ins., fasc. 46, 1907, p. 316.

Ludius pruininus subsp. noxius (Hyslop) (Corymbites), Proc. Biol. Soc. Wash., XXVII, 1914, p. 69; Contr. Bur. Ent., Bull. 156, U. S. Dept. Agr., 1915, p. 12, fig. 4*a*; Walton, Farmers' Bull. 835, U. S. Dept. Agr., 1917, p. 22, fig. 14*a*.

Ludius æripennis (Kirby) (Aphotistus), Fauna Bor. Am., IV, 1837, p. 150; Germ., (Diacanthus), Zeits. f. d. Ent., IV, 1843, p. 82; Lec., (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 439; Cand., Mon. Elat., IV, 1863, p. 157; Packard, Guide Study Ins., ed. 2, 1870, p. 462.

appropinquans (Rand.) (Elater), Boston Jour. Nat. Hist., II, 1837, p. 5.

Ludius æripennis subsp. tinctus (Lec.) (Corymbites), Proc. Acad. Nat. Sci. Phila., 1859, p. 85; Cand., Mon. Elat., IV, 1863, p. 158.

semimetallicus (Walk.) (Diacanthus), Nat. in Vanc., II, 1866, p. 325; Lec., Ann. Mag. Nat. Hist., (4) VI, 1870, p. 401.

Ludius splendens (Ziegler) (Diacanthus), Proc. Acad. Nat. Sci. Phila., II, 1844, p. 44; Lec., (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 439; Cand., Mon. Elat., IV, 1863, p. 158; Blatchley, Col. Ind., 1910, pp. 764, 768.

Ludius suckleyi (Lec.) (Corymbites), Rept. Expl. R. R. Route Miss. to Pac., XII, 3, 1857, p. 46; Cand., Mon. Elat., IV, 1863, p. 171.

Ludius suckleyi olympiæ n. subsp.

Ludius leucaspis (Germ.) (Diacanthus), Zeits. f. d. IV, 1843, p. 73; Cand., (Corymbites), Mon. Elat., IV, 1863, p. 153.

Ludius leucaspis subsp. umbripennis (Lec.) (Corymbites), Rep. Surv. R. R. Route Miss. to Pac., XII, 3, 1857, p. 46, Ins., p. 17; Cand., Mont. Elat., IV, 1863, p. 182.

gracilior (Lec.) (Corymbites), Smiths. Misc. Coll., VI, No. 140, 1863, p. 49.

||*nubilipennis* (Lec.) (Corymbites), Lec., Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 441; Rep. Surv. R. R. Route Miss. to Pac., XII, 3, 1857, p. 17.

Ludius aratus (Lec.) (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 438; Cand., Mon. Elat., IV, 1863, p. 161.

Ludius nigricornis (Panzer) (Elater), Fauna Germ., 61, 1799, no. 5; Cand., (Corymbites), Mon. Elat., IV, 1863, p. 159, etc.

metallicus (Payk.) (Elater), Fauna Suec., III, 1800, p. 19; Cand., (Corymbites), Mon. Elat., IV, 1863, p. 159, etc.

nitidulus (Lec.) (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 438.

Ludius æthiops (Hbst.) (Elater), Käfer, X, 1806, p. 70, t. 164, f. 4; Germ., (Pristolophus), Zeits. f. d. Ent., IV, 1843, p. 86; Lec., (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 443; Cand., Mon. Elat., IV, 1863, p. 137; Heyne, Taschenb. Exot. Käfer, 1908, p. 163, t. 25, f. 53; Blatchley, Col. Ind., 1910, pp. 764, 766.

lævigatus (Hbst.) (Elater), Käfer, X, 1806, p. 45, t. 162, f. 1.

nigrans Cast., Hist. Nat. Ins. Col., I, 1840, p. 241.

Ludius conjungens (Lec.) (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 440; Cand., Mon. Elat., IV, 1863, p. 165.

præses (Cand.) (Drasterius), Mem. Acad. Sci. Brux, XVII, 1864, p. 28; Cand., (Corymbites), Cat. Elat., 1891, p. 173; Horn, Tr. Am. Ent. Soc., III, 1871, p. 321.

Ludius conjungens var. lecontei (Cand.) (Corymbites), Mem. Soc. Sci. Liege, 2d Ser., IX, 1881, p. 94.

Ludius conjungens subsp. obversus (Horn) (Corymbites), Tr. Am. Ent. Soc., III, 1871, p. 322.

Ludius planulus (Lec.) (Corymbites), Proc. Am. Phil. Soc., XVII, 1878, p. 460.

Ludius fallax (Say) (Elater), Tr. Am. Phil. Soc., VI, 1836, p. 170; Lec., (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 446; Cand., Mon. Elat., IV, 1863, p. 152.

bombycinus (Germ.) (Diacanthus), Zeits. f. d. Ent., IV, 1843, p. 70.

semilutens (Lec.) (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 445; Cand., Mon. Elat., IV, 1863, p. 173; Cat. Elat., 1891, p. 171.

Ludius medianus (Germ.) (Diacanthus), Zeits. f. d. Ent., IV, 1843, p. 71; Cand., (Corymbites), Mon. Elat., IV, 1863, p. 145.

rubidipennis Lec., (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 437; Cand., Mon. Elat., IV, 1863, p. 146.

Ludius nigricollis (Bland) (Corymbites), Proc. Ent. Soc. Phil., III, 1764, p. 68; Horn, Tr. Am. Ent. Soc., III, 1871, p. 322.

Ludius candezei Leng, Jour. N. Y. Ent. Soc., XXVI, 1918, p. 205.

||*elegans* (Cand.) (nec. Kirby), Mem. Soc. Ent. Liege, (2) IX, 1881, p. 97.

Ludius mirabilis (Fall) (Corymbites), Tr. Am. Ent. Soc., XVII, 1901, p. 306.

Ludius hamatus (Say) (Elater), Tr. Am. Phil. Soc., VI, 1836, p. 172; Lec., (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 437; Cand., Mon. Elat., IV, 1863, p. 173; Packard, Guide Study Ins., ed. 2, 1870, p. 462, f. 424; Blatchley, Col. Ind., 1910, pp. 764, 766.

Ludius hieroglyphicus (Say) (Elater), Tr. Am. Phil. Soc., VI, p. 172; Lec., (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 437; Cand., Mon. Elat., IV, 1863, p. 173.

Ludius propola (Lec.) (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 437; Cand., Mon. Elat., IV, 1863, p. 144.

Ludius propola var. furcifer (Lec.) (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 438.

Ludius propola var. nubilus (Lec.) (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 438.

Ludius exclamationis (Fall) (Corymbites), Tr. Am. Ent. Soc., XXXVI, 1910, p. 135.

Ludius triundulatus (Rand.) (Elater), Boston Jour. Nat. Hist., II, 1838, p. 12; Lec., (Corymbites), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 437; Ann. Mag. Nat. Hist., (4) IV, 1869, p. 379; Cand., Mon. Elat., IV, 1863, p. 145; Packard, Guide Study Ins., ed. 2, 1870, p. 462.

Ludius triundulatus var. nebraskensis (Bland) (Corymbites), Proc. Ent. Soc. Phila., I, 1863, p. 355.

Ludius triundulatus subsp. tigrinus (Fall) (Corymbites), Tr. Am. Ent. Soc., XXVII, 1901, p. 306; Ent. News, XVIII, 1907, p. 176.

Ludius hoppingi n. sp.

Subgenus **Paranomus** Kiesnw.

Ludius costalis (Payk.) (Elater), Fauna Suec., III, 1800, p. 37; Kiesnw., (Paranomus), Naturges. Ins. Deutsch., Col., IV, 1858, p. 303, note 1; Cand., (Corymbites), Mon. Elat., IV, 1863, p. 177.

maculipennis (Lec.) (Eanus), Smiths. Misc. Coll., VI, No. 167, 1863, p. 85.

pictus (Cand.) (Corymbites), Mon. Elat., IV, 1863, p. 177.

vagus (Lec.) (Limonius), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 434.

decoratus (Mann.) (Diacanthus), Bull. Mosc., XXVI, 1853, III, p. 229; Cand., (Corymbites), Mon. Elat., IV, 1863, p. 179.

Ludius estriatus (Lec.) (Limonius), Tr. Am. Phil. Soc., (n. s.) X, 1853, p. 434; Lec., (Eanus), Smiths. Misc. Coll., III, 1861, Classif. Col. N. Am., p. 171; Cand., (Corymbites), Mon. Elat., IV, 1863, p. 178.

Ludius granicollis n. sp.

Genus **Hemicrepidius** Germar

This genus is exclusively American and with one exception is limited to North America. It is generally placed close to *Ludius (Corymbites)* on account of the incompletely margined clypeus yet it is more nearly allied to *Athous* as shown by the long first tarsal segment and lobed second and third segments. In several of the species the clypeus is also completely margined though not projected forwards as is usual in *Athous*. In Dr. Horn's most excellent revision,[27] considerable emphasis is laid upon the fact that in certain species the posterior part of the propleuræ is quite smooth. Larger series than Horn had access to have shown that this character is a variable one and not always to be completely relied upon. The clypeus and mesosternum are also somewhat variable within the limits of a species.

Hemicrepidius tumescens (Lec.) was first taken on Santa Cruz Island, off the coast of southern California. The specimens more recently collected have been taken along the seashore of Humboldt Co., Calif., and at Waldport and Cannon Beach, Oregon, I found it in numbers under driftwood logs above the line of summer high tides. I have not seen specimens collected from the seashore of middle California. *Asaphes hirtus* Cand., a related though readily separated species, is, however, fairly common at times in the sand dunes south of San Francisco. The type of *tumescens* was a female. The males are, as usual in the genus, much smaller, and generally much darker, quite piceous, resembling very much the darker phases of *decoloratus* Say.

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[27] Notes on the species of *Asaphes* of Boreal America, by George H. Horn, Tr. Am. Ent. Soc., vol. VIII, 1880, pp. 69-75.

Hemicrepidius lecontei (Cand.) is a species founded upon males. The females are quite different in appearance, resembling somewhat the females of *tumescens*. For this reason, it has at times been stated that *lecontei* was but the male of *tumescens*. That is, however, incorrect. *Hemicrepidius lecontei* (Cand.), is a distinct species, differing not only by having shorter pile and of a more uniform length throughout, but by having the prosternal mucro flexed and the mesosternal lobes not prominent. The females are usually brown or piceous but the males generally have each elytron ornamented with a broad yellow vitta. This species is also a more inland one being commonest in the Willamette Valley of Oregon and the Puget Sound region of Washington.

Hemicrepidius soccifer (Lec.) is also a species about which there has been some confusion. It extends from New Mexico into Arizona. I have seen large females from Mt. Lemon, Santa Catalina Mts., Ariz., and a fair series of males from the high Chiricahua Mts. of Ariz. When fully pigmented the males are very dark brown or even piceous in color and look not unlike more elongate specimens of the dark phase of *decoloratus*. Aside from the characters given by Horn, they also have the front quite definitely sulcate and the clypeal margin practically complete, thus closely simulating an *Athous*.

Genus **Melanactes** LeConte

Melanactes agrypnoides, Van Dyke, new species

Large, robust, dull black, antennæ and legs rufopiceous. Head broadly, shallowly sulcate in front, rather coarsely, somewhat closely punctured; antennæ about reaching hind angles of prothorax, second segment small, slightly longer than broad, third longer and apically dilated, fourth to tenth broadly serrate, the fourth broader than long, the following gradually narrower, the eleventh elongate and suddenly constricted before apex. Prothorax from apices of hind angles to apex, longer than broad, sides evenly, rather broadly arcuate from hind angles and narrowed toward apex, hind angles prominent, distinctly divergent and blunt at apex, carinate, the carinæ long and close to margin, the marginal groove extending but slightly beyond the middle, the disk convex, not flattened, rather coarsely, moderately closely punctured in front and at sides, more finely at middle and behind, without evident median canaliculation but with prominent prescutellar tubercle. Scutellum subquadrate, with margins well elevated and disk rather finely punctured. Elytra almost twice as long as broad, sides slightly arcuate and gradually narrowed from anterior third to apex, disk convex, the striæ well impressed at base, elsewhere indicated only by series of fine, moderately closely placed punctures, the intervals flat except at base and very finely punctured, the humeri prominent, the ninth interval very prominent, almost carinate at basal half and with deep groove between it and margin. Beneath the prosternum and metasternum coarsely not closely punctured, the propleuræ more finely and closely and elsewhere very finely punctured. Length 28 mm., breadth 9 mm.

Holotype: No. 3193, Mus. Calif. Acad. Sci., a unique in my collection, collected at **Nogales, Ariz.,** Aug. 14, 1906, by F. W. Nunenmacher.

This fine species as its name indicates looks very much like an *Agrypnus* and quite unlike any of the other species of *Melanactes.* Aside from its peculiar facies and dull appearance, the distinctive features are the markedly serrate antennæ, the rather small third segment, longer than fourth in other species, prominent prescutellar tubercle, and subcarinate ninth elytral interval.

Genus **Agriotes** Eschscholtz

This genus is well represented in western North America and many of the species are quite variable as to color, dichromatism being common as it is with the eastern species *stabilis, fucosus,* and to a lesser degree in *pubescens.* In *ferruginei-*

pennis, the species is dichromatic in some localities, in others polychromatic. A study of a very large series of this variable species leads me to place it as but a western subspecies at most of *fucosus* and with it I would also place *brunneus* Schfr. There are no distinctive morphological characters to separate them. *Agriotes nevadensis* Lec., also appears in two distinctive color phases, the typical rufous phase as well as a dark piceous or black phase, the latter superficially very much resembling *hispidus* Lec. A number of new species have also been found in recent years which will now be described.

Agriotes cylindricus Van Dyke, new species

Elongate, subcylindrical; brown or reddish brown. Each elytron generally with a broad testaceous vitta, the anterior margin of prothorax and hind angles, basal segment of antennæ and legs also testaceous; and sparsely clothed with fine, short pile. Head coarsely, closely punctured; antennæ reaching slightly beyond hind angles of prothorax, second segment two and a half times as long as broad, third much smaller, and each evidently shorter than fourth. Prothorax somewhat less than one-fourth longer at middle than broad, spatulate, very convex, sides broadly arcuate in front, sinuate posteriorly, hind angles moderately prominent and hardly divergent, carina fine, slightly more than one-third length of prothorax, feebly divergent from lateral margin, the lateral margin very fine and generally interrupted at middle though often complete, disk coarsely, deeply and rather closely punctured in front, gradually more finely behind, rather definitely canaliculate at middle behind. Elytra about two and a half times the length of the prothorax as well as its own breadth, sides parallel in front, gradually narrowing and rounded towards apex, the disk convex, striæ distinct and rather coarsely, closely punctured, especially at sides, the intervals flat and but little wider than the strial punctures, finely punctured and transversely rugose. Beneath coarsely punctured in front, gradually finer towards apex, the punctures of propleuræ slightly finer and better spaced than those of prosternum, those of metasternum quite close, the hind coxal plates narrow and very gradually dilated inwardly. Length 7 mm., breadth 2 mm.

Holotype: Male, No. 3194, Mus. Calif. Acad. Sci., and numerous designated *Paratypes* from a series of over forty specimens collected near **Camp Potwisha, Sequoia National Park, Calif.,** during May and June, 1929.

This species belongs close to *sparsus* Lec. and is about of the same length but narrower, more parallel, more convex, with the prothorax proportionally longer and its discal punctures coarser and somewhat closer, the strial punctures of the elytra much coarser, more rounded, and the intervals narrower. In *sparsus,* the punctures of the propleuræ are close together and of the prosternum rather sparse and widely spaced.

Agriotes bivittatus Van Dyke, new species

Subcylindrical, short and obtuse at both extremities; opaque, black, each elytron with a dull yellow vitta, three intervals wide, extending in an oblique direction from humeral angle almost to apex, the tibiæ and tarsi slightly testaceous, and clothed with short golden pubescence. Head coarsely, closely punctured; antennæ short, not reaching apices of hind angles of prothorax, second segment about three-fourths length of fourth, the third slightly shorter, outer segments moderately serrate, the fourth segment the longest and broadest, the following gradually narrower. Prothorax longer than broad, quite convex, sides gradually convergent, almost straight from in front of hind angles until near apex where slightly rounded, lateral margin sharply defined and complete, hind angles not divergent, moderately long and with carina well marked and divergent forwards from margin; the disk slightly flattened posteriorly and with a moderate canaliculation which ends in a distinct basal tubercle, the surface coarsely, deeply and densely punctured. Elytra about twice as long as prothorax, widest at middle, gradually arcuately narrowed to blunt apices, disk with striæ finely impressed and rather finely, closely punctured, the intervals flattened, very finely punctured and rugose, the surface presenting a granular appearance. Beneath with the prosternum rather coarsely and moderately closely punctured, the propleuræ coarsely and shallowly punctured and the abdomen rather finely punctured, the hind coxal plates somewhat suddenly dilated within. Length 5.5 mm., breadth 1.75 mm.

Holotype: No. 3195, Mus. Calif. Acad. Sci., and two *Paratypes,* one 5.5 and the other 6.5 mm. long, from **Corvallis, Oregon.**

This very distinct little species would come in LeConte's table after *nevadensis* Lec. and before *apicalis* Lec., to the latter of which it is no doubt somewhat related as shown by its opaqueness and general features.

Agriotes criddlei Van Dyke, new species

Small, compact, rather blunt at both extremities, opaque, black, elytra dark brown, legs somewhat testaceous, and clothed with short fulvous pile. Head closely, coarsely punctured; antennæ barely reaching apices of hind angles of prothorax, second and third segments of about equal length and each a bit more than three-fourths the length of fourth, the intermediate segments distinctly serrate, the sixth the broadest. Prothorax longer than broad, sides straight, just perceptibly converging forwards and rounded at apex; hind angles well marked, not divergent and with distinct carina which diverges markedly from margin forwards, lateral margin sharply defined and complete, disk coarsely, umbilicately and rather closely punctured, canaliculate posteriorly at middle, and with slight tubercle in front of scutellum. Elytra slightly more than twice as long as broad, with sides almost parallel in front, gradually arcuately narrowed posteriorly to apices, disk with striæ finely impressed, the striæ finely, closely punctured, coarser near base, the intervals flattened, minutely punctured, finely rugose and granular. Prosternum coarsely, deeply but not closely punctured, the propleuræ coarsely and shallowly punctured and the abdomen rather finely punctured, the hind coxal plates rather suddenly dilated within. Length 4.5 mm., breadth 1.25 mm.

Holotype: No. 3196, Mus. Calif. Acad. Sci., and two *Paratypes* in my collection, taken near **Aweme, Manitoba, Canada,** June 10, 1909, by Mr. Norman Criddle, and by him kindly presented to me. Three other specimens are in my collection, two collected at Medicine Hat, Alberta, May 3, 1924, by Mr. F. S. Carr, and one from the Grand Teton National Park, Wyoming, June 21, 1930, collected by myself. This species is named after Mr. Criddle as a mark of regard for numerous favors received.

This, the smallest species in our fauna, bears considerable resemblance to *bivittatus* and is without doubt closely related to it. It should follow that in our lists. Neither are closely related to *montanus* Lec., the general facies, opaqueness and variolate type of pronotal punctures distinctly separating them.

Agriotes porosus Van Dyke, new species

Elongate, subcylindrical; black, antennæ and legs somewhat piceous. Head coarsely, closely punctured; antennæ reaching slightly beyond hind angles of prothorax, second and third segments about equal in length and each three-fourths length of fourth. Prothorax slightly longer than broad, very convex, sides parallel behind, broadly rounded and convergent in front, hind angles moderately prominent, not divergent, the carina distinct, slightly divergent from sides anteriorly and somewhat more than one-fourth length of prothorax, lateral margin complete and sharply defined, disk with vague canaliculation at middle, posteriorly coarsely, deeply and closely punctured. Elytra slightly more than twice as long as prothorax, parallel in front, gradually arcuately narrowing from middle to apex, the striæ fine, rather closely, coarsely punctured in front, more finely posteriorly, intervals flat, finely punctured and slightly transversely rugose, especially towards base. Beneath rather coarsely, closely punctured on prosternum, more finely and closely on propleuræ, giving granular appearance, and very finely and closely on both metasternum and ventral segments. Length 8 mm., breadth 2 mm.

Holotype: No. 3197, Mus. Calif. Acad. Sci., a unique collected by myself in the **Black Mountains** of **North Carolina,** during June, 1902.

This species is of about the same size as *avulsus* Lec. but the latter is shining, has the second and third antennal segments almost equal in length to the fourth, the prothorax quite narrowed in front, with diverging hind angles and disk not closely punctured, as well as having distinctly red antennæ and legs. From the two Pacific Coast species with which it might be confused, it can be separated as follows: *Agriotes hispidus* Lec. has longer and more erect pile, pronotal punctures less coarse, the lateral margin often incomplete, the prosternal punctures finer and the legs generally more reddish; and the black phase of *nevadensis* Lec. has the second and third antennal segments shorter, the prothorax more flattened, more narrowed in front and more finely and sparsely punctured, as is also the prosternum. According to the LeConte table[28] it would be placed next to *nevadensis* Lec.

Agriotes blaisdelli Van Dyke, new species

Elongate, subdepressed, testaceous, clothed with short pubescence. Head coarsely, shallowly punctured, antennæ long and filiform, reaching at least three segments beyond hind angles of prothorax, second segment about twice as long as broad, third one-half longer, fourth one-third longer than third, the following gradually shorter. Prothorax perceptibly longer than broad, sides sinuate in front of hind angles, evenly arcuate in front, broadest at middle and narrowest at apex, hind angles acute, slightly divergent, carinate, disk slightly convex, coarsely, shallowly and moderately closely punctured, and with an evident yet not distinct canaliculation at middle. Elytra over three times as long as prothorax, sides slightly arcuate, apex subacute, disk moderately convex, striæ very fine, often obscure, and finely punctured, intervals minutely punctured and finely granulose. Prothorax punctured beneath in same manner as above. Abdomen finely punctured, the hind coxal plates moderately dilated inwardly and with hind margin of expanded portion truncate posteriorly. Length 4.5 mm., breadth 1.25 mm.

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[28] Tr. Am. Entom. Soc., XII, 1884, p. 16.

Holotype: No. 3198, Mus. Calif. Acad. Sci., and several designated *Paratypes* from a series of fifteen specimens collected at **Shasta Retreat, Siskiyou Co., Calif.**, alt. 2416 ft., July 3, 1905, by Dr. F. E. Blaisdell. A large series in the possession of Dr. Blaisdell has also been examined, besides a single individual collected by myself at Bubbs Creek, Kings River region, Fresno Co., Calif., alt. 9700 ft., July 7, 1910, and three specimens from Santa Cruz Co., Calif., June, 1896, collected by Mr. F. W. Nunenmacher.

This small and entirely testaceous species could not possibly be confused with any of the various phases of *Dolopius lateralis* Esch. nor with any of the species of *Agriotes.* Its somewhat flattened appearance would lead one to place it in *Dolopius* but the lateral margin of the prothorax is clearly that of *Agriotes* and not the other. This character is, however, a very weak one and as it is the only one that separates the two genera, they may some day have to be united.

Betarmon bigeminatus Randall

In the eastern part of our country this species appears to be quite stable as to size and coloration but from the Rocky Mountains west to Vancouver Island, there appears a race which is distinctly larger, fully 1 mm. longer than the average eastern individual, more shining, and occasionally with the yellow markings of the elytra running together so that the elytra are almost entirely yellow as is the case with two specimens which I have examined from Nanaimo, British Columbia. I have specimens of this large race from near Longs Peak, Colorado, the southern part of Yellowstone Park, and from two places on Vancouver Island. *Betarmon californicus* Schfr. is even more variable as to color, the elytra varying from entirely black, through the usual phase with suture and apices black, to others where they are entirely yellow. The head always remains black but the pronotum though usually yellow or orange may have a black discal patch or vitta.

Genus **Sericus** Eschscholtz

Sericus rugosus Van Dyke, new species

Elongate, narrowed in front and behind, subopaque, reddish brown to dark brown, sparsely clothed with short, fine pile, somewhat denser beneath. Head rather coarsely, densely, umbilicately punctured, mouthparts conspicuously prognathous, labrum large and transverse; antennæ extending a segment and a half beyond hind angles of prothorax in male, just reaching the same in female, second and third segments small, about equal in length and a little longer than broad, together equal to fourth segment in male, the third a little longer than second in female and together longer than fourth, fourth to tenth distinctly serrate. Prothorax including hind angles a third longer than broad, distinctly narrowed in front, hind angles long and acute, finely carinate, sides barely arcuate in male, distinctly so in female, disk convex, coarsely, densely, and umbilicately punctured, faintly canaliculate at middle behind. Scutellum elongate, slightly convex and densely punctured. Elytra two and a half times as long as prothorax, gradually narrowed from behind humeri in male, from about middle in female, disk convex, striæ fine and finely, closely punctured, intervals flat, finely, irregularly punctured and finely, transversely rugose. Beneath coarsely, not closely punctured on prosternum, densely and shallowly on propleuræ, finely and very densely on metasternum, and finely, more sparsely on basal segments of abdomen. Length 9-10 mm., breadth 2 mm. in male to 2.5 mm. in female.

Holotype: No. 3199; and *Allotype:* No. 3200, Mus. Calif. Acad. Sci., and several designated *Paratypes* in my collection, the first collected by myself in the **Yosemite Valley**, June 7, 1921, the second collected in Eldorado Co., Calif., June 11, 1906, by Mr. F. W. Nunenmacher. Among the other nine specimens are representatives from Siskiyou, Shasta, Trinity and Mariposa counties.

This very distinct and somewhat opaque species is perhaps most closely related to *incongruus* Lec. but differs by being proportionately longer and narrower, more coarsely punctured, with finer carinæ on hind angles of prothorax, and of a more uniform color. It superficially resembles some of the smaller specimens of *Agriotes ferrugineipennis* Lec.

Subfamily **Plastocerinæ**

The members of this group are entitled to subfamily rank but no more. As stated by LeConte they grade gradually into the true Elateridæ. The gap between *Eniconyx,* of the former.

and *Aptopus* of the latter is but slight. It is characteristic of our southwest though not limited to that region, for certain members are to be found in Mexico and South America and even in the Old World. The genus *Euplastius* established in 1903 by O. Schwarz, I am inclined to believe will some day be found not to belong to our fauna. It seems strange that two species of a genus, one supposedly collected in California, the other in Alabama, should find their way into the hands of a European institution, while none of the many excellent collectors who have worked in both California and Alabama should run across either. Horn[29] in 1881, described and figured females of a number of our species in the genera *Euthysanius* and *Aplastus*, showing that they were not only wingless but with elytra greatly reduced and abdomens much enlarged especially in *Euthysanius*. He believed that in *Plastocerus* the female was like the male in all regards except in having the antennal appendages shorter. What he figured as *Plastocerus frater* Lec., he stated was "undoubtedly a female." Five specimens in my collection which agree with this in every regard are shown by an examination of the genitalia to be males. I also have a true female which is more extreme in its degree of degeneration than is any female *Euthysanius*. The elytra are reduced to mere transverse pads, about two-thirds the length of the prothorax, and the eight-segmented abdomen is over three and a half times as long as the entire forebody (head, pro-, meso- and metathorax). The species are all so unstable and variable as to outline and sculpturing that one needs to have many specimens in order to make determinations at all certain.

Fall,[30] Schaeffer[31] and Tanner[32] have added to the number of species originally made known by LeConte and Horn. In my collection are also a number of new species. These I will now describe.

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[29] Tr. Am. Ent. Soc., IX, 1881, pp. 76-81, pl. 1 & 2.
[30] Psyche, 35, 1928, pp. 139-146.
[31] Journal N. Y. Ent. Soc., 24, 1916, p. 266.
[32] Pan-Pacific Ent., 2, 1926, pp. 188-190.

Genus **Euthysanius** LeConte

Synoptic Table for Males

1. Pronotum coarsely, more or less densely punctured........... 2

Pronotum finely, somewhat sparsely punctured............... 3

2. Large, 18-25 mm. in length, robust, reddish brown; terminal segment of antennæ decidedly shorter than appendage of eleventh segment; pronotum coarsely, closely punctured at sides, more finely and less closely at middle, the disk shining, sides rounded in front but distinctly divergent posteriorly. Southern Calif....................................*lautus* Lec.

Smaller, 16 mm. in length, subcylindrical, rufotestaceous; terminal segment of antennæ about as long as appendage of eleventh segment; pronotum, coarsely and cribrately punctured over entire surface, the disk subopaque, sides slightly arcuate in front and gradually divergent posteriorly. Mts. of Tulare Co., Calif............................*cribricollis* n. sp.

3. More or less rufotestaceous in color........................ 4

Dark brown or piceous in color, 18 mm. in length, rather robust; last antennal segment not quite as long as appendage of eleventh segment; prothorax broader than long, disk distinctly though variably punctured, sides slightly arcuate in front, thence slightly divergent to widely diverging hind angles. San Mateo Co., Calif........................*piceus* n. sp.

4. Moderately large and rather robust species, 17-19 mm. in length, rufotestaceous; last antennal segment almost as long as appendages of eleventh................................ 5

Narrower and more graceful or smaller species, rufotestaceous.. 6

5. Prothorax longer than broad, trapezoidal; rufopiceous; elytra elongate, distinctly narrowed behind and with striæ barely impressed except towards sides and apex; length 17 mm. Owens Valley, Calif.................................*horni* Fall

Prothorax fully as broad as long; rufocastaneous; elytra but little narrowed behind and with striæ deeply impressed; length 17-19 mm. Western foothills of the Sierra, Calif......*pretiosus* Lec.

6. Species with large eyes, hemispherical; last segment of antennæ about as long as appendage of eleventh; prothorax longer than broad, sides almost straight and diverging posteriorly; elytra distinctly narrowed posteriorly; 17-18 mm. long.... 7

Species with eyes much reduced in size; last segment of antennæ very distinctly shorter than appendage of eleventh; prothorax about as wide as long, subcampanulate; elytra with sides parallel in basal two-thirds, striæ feebly impressed; length 15.5 mm. White Mts., Gila Co., Ariz.....*imparoculatus* Fall

7. Upper surface clothed with an evident sparse, fine pile giving it a dull appearance; prothorax about as long at middle as broad, disk very finely punctured; the sides straight and slightly diverging posteriorly to base of hind angles which are rather long, narrow and abruptly divergent; the elytra with striæ shallowly impressed and vaguely punctured; length 18 mm. Zion Nat. Pk. and St. George, Utah..............*blaisdelli* Tanner

Euthysanius cribricollis Van Dyke, new species

Elongate, subparallel, rufotestaceous, subopaque, conspicuously clothed with a fine, short, suberect fulvous pile. Head triangularly impressed in front, coarsely, cribrately punctured, and conspicuously clothed with fulvous pile; eyes prominent, hemispherical; antennæ about reaching hind angles of prothorax, outer segments pectinate as usual but with appendages rather short, about three times length of segments, the last segment distinctly shorter and more robust than appendage of eleventh segment. Prothorax subcampanulate, distinctly longer at middle than broad, the front margin conspicuously lobed; sides arcuate, gradually divergent, the hind angles prominent, robust, subacute at apex, divergent from sides and carinate; disk very convex, coarsely, closely, umbilicately and cribrately punctured over entire surface, median impression shallow but distinct and complete. Scutellum elongate, concave, finely punctured and evenly rounded posteriorly. Elytra almost three times as long as broad, sides gradually narrowing posteriorly, convex, the striæ well impressed and rather coarsely, closely punctured, the intervals convex and finely, irregularly punctured. Beneath, propleuræ coarsely, rather closely punctured, prosternum less coarsely punctured and carinate at middle, afterbody more finely punctured, hind tibiæ emarginate on anterior margin. Length 18 mm., breadth 4.5 mm.

Holotype: Male, No. 3201, Mus. Calif. Acad. Sci., and thirteen *Paratypes* collected near **Kaweah, Tulare Co., Calif., July 15, 1930**, by Mr. Roy S. Wagner. The holotype and a couple of paratypes are in the collection of the California Academy of Sciences through the courtesy of Mr. Wagner, the remainder in Mr. Wagner's collection. Another specimen collected at Three Rivers, near the Sequoia National Park, is in my collection.

The coarse and cribrate prothoracic punctation and rather short appendages should readily distinguish this species from its fellows.

Euthysanius piceus Van Dyke, new species

Robust, subparallel, piceous, the antennæ, legs, metasternum and abdomen somewhat rufous, body slightly shining though sparsely clothed with a short, fulvous pile. Head broadly, somewhat triangularly impressed in front and rather coarsely and closely punctured; eyes only moderately prominent, not hemispherical, the interocular area greater than their common breadth; antennæ almost reaching hind angles of prothorax, the appendages of median segments more than three times the length of the segments, the last segment slightly shorter than the appendage of the eleventh. Prothorax broader than long at middle; front margin slightly lobed; sides somewhat arcuate though often straight and slightly divergent to hind angles which are short, robust, obliquely truncate at apex, carinate and divergent from the side margin; disk somewhat convex, moderately not closely and irregularly punctured, median impression not generally present (well defined in one specimen). Scutellum elongate, flattened, longitudinally carinate at middle, punctured and with apical notch. Elytra somewhat more than two and a half times as long as broad, sides very slightly narrowing posteriorly, convex, the striæ sometimes finely but generally well impressed and somewhat coarsely and closely punctured, the intervals flat or convex, finely, irregularly punctured and rugulose. Beneath, propleuræ punctured in front and at sides, smooth and shining behind, prosternum sparsely punctured and carinate at middle, the afterbody finely and sparsely punctured, except at apex of last segment where rather close, the hind tibiæ straight and without emarginations. Length 18 mm., width 5 mm.

Female, similar to specimen figured as No. 5, Plate 1, by Horn.[33] The "Coast region of Cal. south of San Francisco" is the territory where this species lives. *E. pretiosus* Lec. is always found in the interior and never near the coast. My female was taken at Burlingame, June 19, 1909. It is somewhat rufopiceous, the terminal segments of the antennæ missing, otherwise in perfect agreement with the description given by Horn for the female of *pretiosus*, its description therefore need not be repeated.

The males of this species might be taken for darker phases of *E. pretiosus* Lec. They are, however, somewhat shorter and stockier, have less prominent eyes (almost hemispherical in *pretiosus)*, the distance between the eyes greater, the antennal appendages much shorter and the terminal segment shorter than the appendage of the eleventh, about equal in the others, generally more robust prothorax, with sides more arcuate and hind angles shorter and more suddenly divergent, the scutellum also with a well defined carina in most of my specimens.

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[33] Tr. Am. Ent. Soc., IX, 1881, p. 81, Plate 1, fig. 5.

Holotype: Male, No. 3202, Mus. Calif. Acad. Sci., and nine male *Paratypes* in my collection, taken at **Burlingame, San Mateo Co., Calif.**, July 17, 1909, by Mr. H. Kusche.

Euthysanius pretiosus LeConte, Female

I have a specimen of what is probably this species. It differs from the female of *piceus* primarily in having a longer abdomen, approaching in this regard the females of *lautus,* in having the sides of the pronotum more arcuate, and the hind angles shorter, more robust and not divergent. In my two female specimens of *E. lautus* Lec., one has the hind angles divergent as in the specimen figured by Horn (Pl. I, fig. 3) but not to such a degree, the other has them much as in my specimen of *pretiosus,* not divergent. In these degenerate females, variations occur to such a degree that one cannot determine the species by characters alone. The same thing applies to the females of *Pleocoma.*

Euthysanius blaisdelli Tanner

Specimens collected at St. George, Utah, by Mr. Warren Knaus have the prothorax somewhat more narrowed in front and the sides less arcuate than are those from the type locality, Zion National Park.

Genus **Plastocerus** LeConte

Though all the species are variable as regards the shape of the prothorax, general sculpturing, and even the presence or absence of a prosternal carina, there is a certain sum of characters which will readily enable the species to be separated especially if one has a series of specimens. As indicated previously, I consider all winged individuals as males, therefore differ from Horn as to the status of the three which he discussed. *Plastocerus frater* Lec. I consider a well defined species because of the short antennal appendages. All specimens that I have seen come from near Los Angeles. *Plastocerus schaumi* Lec. is the most variable of all the species and is the most widely distributed, extending from San Diego and Imperial to Kern Co. *Plastocerus macer* Lec., should for the present, because of its shorter and less divergent hind prothoracic angles and more pronounced pronotal punctation, be kept separate from the preceding though it may later on be proven to be but a variety of it as stated by Horn. *Plastocerus megalops* Fall and *granti* Schfr. are of course good species and the one which I am describing is equally distinct.

Table for Separation of Males

1. Appendages of outer segments of antennæ three to four times length of segment.................................... 2

Appendages of outer segments of antennæ less than three times length of segment, pronotum coarsely and densely punctured 6

2. Hind angles of prothorax strongly divergent and carinate...... 3

Hind angles hardly divergent, feebly carinate................ 5

3. Eyes less prominent, not quite hemispherical, elytra somewhat shining.. 4

Eyes very prominent, hemispherical, elytra finely rugulose and dull; Claremont, Calif............................*megalops* Fall

4. Sides of prothorax arcuate in front at most, pronotum rather finely not deeply punctured; southern Calif...........*schaumi* Lec.

Sides of prothorax suddenly expanded in front into wing-like processes, pronotum coarsely, somewhat cribrately punctured; Coalinga, Calif..........................*amplicollis* n. sp.

5. Sides of prothorax feebly arcuate in front, pronotum densely punctured; southern Calif..........................*macer* Horn

6. Hind angles of prothorax carinate, prosternum not carinate, length 10-11 mm.; southern Calif......................*frater* Lec.

Hind angles of prothorax non-carinate, prosternum carinate at middle, length 9 mm.; southwest Texas...............*granti* Schfr.

Plastocerus amplicollis Van Dyke, new species

Elongate, subparallel, rufotestaceous, underside and legs lighter, and sparsely clothed with a rather coarse fulvous pile. Head very coarsely and densely punctured, broadly, shallowly sulcate in front; eyes almost hemispherical, the width of pair not quite equalling the interocular diameter; antennæ about reaching base of hind angles of prothorax, the appendages of the median segments almost four times the length of the segments, and the eleventh segment about equal in length to the appendage of the tenth but more robust. Prothorax broader than long, front margin distinctly lobed; the sides broadly and rather abruptly expanded in front into wing-like processes, thence deeply emarginate posteriorly to the long, narrow and divergent hind angles; disk coarsely, closely, and somewhat cribrately punctured, the median impression well marked. Elytra three times as long as broad, slightly narrowed towards apex, striæ finely yet distinctly impressed and somewhat regularly punctured, the intervals slightly convex behind. Beneath: Prosternum rather coarsely and sparsely punctured, with prominent carina at center, the propleuræ more shallowly punctured, elsewhere very finely punctured, the hind tibiæ shallowly emarginate on anterior margin. Length 12 mm., breadth 3 mm.

Holotype: Male, No. 3203, Mus. Calif. Acad. Sci., and one *Paratype,* the first collected on the **Los Gatos Divide** of the Mt. Diablo Range northwest of **Coalinga, Fresno Co., Calif.,** June 6-8, 1907, the second from near Coalinga, Calif., June 9, 1907, by Prof. J. C. Bradley and kindly presented to me many years ago.

The prothorax with its wing-like expansions and coarsely punctured disk will enable this species to be easily recognized.

Genus **Aplastus** LeConte

Key for Separation of Males[34]

1. Third segment of antennæ long, almost equalling fourth in length and breadth; the antennæ as a whole slender, feebly serrate, the basal three segments only pilose; sides of prothorax parallel, not margined, hind angles strongly divergent; length 15 mm. San Diego, Calif................*angusticollis* Horn
   Third segment of antennæ short, never approaching fourth in length, outer segments with short erect hair.............. 2

2. Sides of prothorax without well defined margin or with but a short one near hind angles (a narrow smooth line or even a narrow groove may, however, exist laterally)............. 3
   Sides of prothorax with well defined margin, at least in basal area. 7

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[34] Modified from that given by Horn, Tr. Am. Ent. Soc., 9, 1881, p. 77.

3. Antennæ delicate yet strongly serrate, the segments narrow at base, rather suddenly dilating towards apex, segments 2-3 small, the third but little larger at most than second, together slightly longer than half the fourth...................... 4

Antennæ more robust and strongly serrate, the outer segments more triangular, gradually dilating from base to apex, third segment more than twice as long as second, the two together nearly as long as fourth; length 15 mm. Southern Calif. . *speratus* Lec.

4. Elytra scarcely striate; eyes not prominent, prothorax slightly broader than long, sides straight and slightly diverging backwards to somewhat more divergent and acute hind angles, the disk rather sparsely and finely punctured; color piceous or rufopiceous; length 11-12 mm. Mojave Desert and adjacent arid territory to Nevada....................*tenuiformis* Horn

Elytra finely though definitely striate, at least near suture..... 5

5. Prothorax about as broad as long, the disk coarsely or moderately coarsely punctured.................................. 6

Prothorax distinctly longer than broad, sides straight and barely divergent backwards to distinctly divergent and acute hind angles, the disk sparsely and finely punctured; eyes not prominent, color rufopiceous; length 13-14 mm. Salt Lake Valley, Utah...................................*cylindricus* n. sp.

6. Eyes not prominent, median segments of antennæ very slightly dilating to middle then more suddenly to apex, pronotum rather coarsely and closely punctured, elytral striæ finely and sharply impressed, color rufopiceous; length 12 mm. Pasadena and Mojave Desert, Calif............*corymbitoides* Horn

Eyes moderately prominent, almost hemispherical, median segments of antennæ subcylindrical basally, the apical expansion appearing almost as an appendage, pronotum moderately finely and closely punctured, elytral striæ finely but not sharply impressed, color rufotestaceous; length 13 mm. Northern Ariz...................................*arizonicus* n. sp.

7. Rufous or reddish brown; third antennal segment always distinctly larger than second, intermediate antennal segments strongly serrate, the segments more or less triangular; elytral striæ well impressed.................................. 8

Brown or piceous; third antennal segment but little if at all larger than second segment; elytral striæ finely or feebly impressed... 11

8. Rufous or reddish brown species, pubescence more or less fine and inconspicuous................................. 9

Robust, piceous species, pubescence rather long, coarse and more or less conspicuous; third antennal segment considerably larger than second and triangular; prothorax with sides almost parallel and abruptly divergent hind angles; length 13 mm. Merced Co., Calif. . . . . *pilosus* n. sp.

9. Rather robust and moderately long species, about four times as long as broad; prothorax generally distinctly longer at middle than broad. 10

Narrow and very elongated species, considerably more than four times as long as broad; prothorax slightly broader than long at middle; outer segments of antennæ about twice as long as broad; length 14.5-17 mm. Tulare, Fresno and Inyo Cos., Calif. . . . . *productus* Fall

10. Intermediate segments of antennæ strongly produced at apex; length 16 mm. Sierra Nevada Mts. from near Oroville to Tulare Co. . . . . *piceicollis* Fall

Intermediate segments of antennæ quite triangular, hardly if at all produced at apex; length 14-16 mm. San Francisco Bay counties, Calif. . . . . *optatus* Lec.

11. Elytral striæ fine but distinct, intervals very finely punctate and scabrous; eyes feebly prominent; length 12-13 mm. San Francisco Bay counties, Calif. . . . . *molestus* Horn

Elytral striæ feeble, somewhat obsolete, intervals densely scabrous punctate; length 16 mm. Camp Nelson, Tulare Co., Calif. . . . . *scabripennis* Fall

Aplastus cylindricus Van Dyke, new species

Narrow, elongate, piceous, legs and antennæ rufopiceous, rather sparsely clothed with short, gray pile. Head channeled between the eyes, coarsely, rather densely punctured; eyes not prominent; antennæ long, seventh segment reaching hind angles of prothorax, second and third segments small, transverse, together about two-thirds length of fourth, segments 4-10 distinctly serrate, each segment narrow and subcylindrical at basal half or two-thirds, then suddenly expanded with free angle prolonged at apex. Prothorax over two and one-half times as long at middle as broad, subcylindrical in front, the sides straight and parallel, hind angles acute and strongly divergent, lateral margin absent though a slight longitudinal lateral impression is evident, disk finely, rather sparsely punctured, median canaliculation fine and vague. Elytra almost three times as long as broad, sides almost straight and gradually narrowing from humeri backwards, the disk with striæ evident and fine near suture, elsewhere somewhat vague, the intervals flattened, finely punctured and finely scabrous. Beneath, prosternum carinate at middle, sulcate between coxæ and rather coarsely punctured, propleuræ more finely punctured, the afterbody rather finely and sparsely punctured. Length 12 mm., breadth 3 mm.

Holotype: Male, No. 3204, Mus. Calif. Acad. Sci., and several designated *Paratypes* from a series of forty specimens collected by the late Mr. Tom Spalding at **Eureka** and neighboring regions of **Utah**, during the month of June of various years from 1912-1924.

This species is closely related to *tenuiformis* and looks like it. It differs from that primarily in having a longer and more cylindrical prothorax, and in having the median antennal segments with the apical dilation more suddenly expanded and appendix like, the segments in *tenuiformis* being quite triangular.

Aplastus arizonicus Van Dyke, new species

Narrow, elongate, rufotestaceous, legs lighter, sparsely clothed with short fulvous pile. Head coarsely, closely punctured, broadly, shallowly sulcate in front; eyes moderately prominent; antennæ long, middle of eighth segment reaching apex of hind angles of prothorax, second and third segments small, the latter the larger, together about two-thirds length of fourth, segments 4-10 serrate, each segment narrow and subcylindrical in basal half, thence gradually dilating towards apex with the free angle produced in the form of an appendage. Prothorax about as broad as long at middle, sides almost straight and slightly diverging from apex to base of hind angles which are acute and divergent, lateral margin evident near hind angles, disk moderately coarsely and sparsely punctured, the median canaliculation distinct and complete. Elytra about three times as long as broad, sides almost straight and gradually narrowing towards apex, the disk with striæ evident though poorly defined, and finely punctured, the intervals flattened, finely punctured and scabrous. Beneath, the prosternum carinate at middle, sulcate between coxæ and coarsely, closely punctured, propleuræ more finely punctured and somewhat shining, the afterbody rather finely sparsely punctured. Length 13 mm., breadth 3.5 mm.

Holotype: Male, No. 3205, Mus. Calif. Acad. Sci., and two *Paratypes,* the first and one of the paratypes from near **Prescott, Ariz.,** June 1910, collected by Mr. J. August Kusche, the second paratype from Flagstaff, Ariz., July 11, 1911, collected by Prof. H. F. Wickham.

This species looks like *corymbitoides* but differs by having much more prominent eyes, the median segments of the antennæ slightly less triangular, the prothorax a bit broader, less coarsely and densely punctured and with a fine yet distinct lateral margin at the sides of the hind angles. In this last regard it shows an approach to the larger and more robust species, all of which have a well defined lateral margin.

Aplastus pilosus Van Dyke, new species

Elongate, robust, piceous, rather densely clothed with coarse, semi-erect pile. Head flattened in front, coarsely, densely punctured; eyes only moderately prominent; antennæ robust, eighth segment reaching apex of hind angles of prothorax, second segment small, as long as broad, third one-third longer and triangular, segments 4-10 strongly serrate, the individual segments triangular with outer margin almost straight and free angle but little produced, the segments gradually diminishing in breadth. Prothorax as broad as long at middle, anterior margin definitely lobed and notched at middle, sides barely arcuate from apex to base of hind angles and slightly divergent, the hind angles robust, strongly divergent, the lateral margin defined at basal half but not distinctly; disk convex, rather coarsely, closely punctured, the median canaliculation faintly defined at center. Elytra about two and one-half times as long as broad, sides almost straight and parallel and broadly rounded at apex, the striæ sharply impressed near suture, finer outwardly, the intervals flat, rather coarsely punctured and scabrous. Beneath, the prosternum longitudinally convex, with a transverse arcuate impression near front margin, and coarsely, closely punctured, the propleuræ similarly punctured in front but smoother behind, the hind body more finely punctured. Length 14 mm., breadth 4 mm.

Holotype: No. 3206, Mus. Calif. Acad. Sci., a unique in my collection, collected in **Merced Co., Calif.**, June 19, 1914, by Mr. F. W. Nunenmacher. The left antenna is abnormal in that there are but ten segments, the sixth and seventh being united into one very large segment.

This is the shortest proportionally and one of the darkest and most robust of our species. The long and coarse pile and rather coarse punctation will also assist in its separation.

Aplastus productus Fall

The characters of the last ventral segment mentioned by Fall, the very marked lateral emargination with a more or less truncate apex, is a variable character. In a specimen in the Blaisdell collection from Huntington Lake, Fresno Co., Calif., collected July 17, 1919, this character is well marked, whereas in a specimen in my own collection from Inyo Co., July 15, 1917, the sides of the last ventral are rather evenly arcuate and the apex notched. I have found that the shape of this segment also varies with other species.

Aplastus piceicollis Fall

If I am right in my interpretation of this species it is as usual a most variable one. The usual color is unicolorous rufotestaceous, those with darker forebody being the exception as are those uniformly dark. It also has a wide range being found on the western flanks of the Sierra from Tulare Co. to Plumas Co. In the Blaisdell collection there is a good series from Sutter Creek, Amador Co., July 25, 1901, in the collection of Mr. Roy S. Wagner is a good series including three females from Kaweah, Tulare Co., July 16, 1930, and I have numbers from intermediate territory. The shape of the intermediate segments of the antennæ is one of the most distinctive features.

Family Cebrionidæ

Cebrio knausi Van Dyke, n. sp.

Moderately elongate, parallel, brown above, antennæ, legs and abdomen testaceous, forebody beneath rufotestaceous, and very sparsely clothed with very short and fine pile. Head rather coarsely, moderately closely punctured, more or less impressed between the eyes; labrum broadly emarginate in front; eyes prominent, almost hemispherical; antennæ somewhat serrate, eighth segment reaching hind angle of prothorax, second segment small, third almost twice as long, two-thirds the length of the following and somewhat triangular, median segments about twice as long as wide and gradually shorter and narrower towards apex. Prothorax about as broad as long at middle, sides straight and feebly diverging towards base, rounded near apex, the hind angles rather small but strongly divergent, disk finely, closely punctured. Elytra over twice as long as wide, striæ feebly impressed, strial punctures not separable, intervals slightly convex, finely closely punctured, the general surface somewhat granulate. Beneath: Prosternum of moderate breadth and triangular between the coxæ; propleuræ moderately finely, closely punctured and scabrous, metasternum rather finely, densely punctured, the abdomen very finely, somewhat sparsely punctured, the last abdominal segment rounded at apex. Length 13 mm., breadth 4 mm.

Holotype: No. 3207, Mus. Calif. Acad. Sci., and one *Paratype* in my collection, collected by Mr. Warren Knaus at **St. George, Utah,** May 22-June 12, 1919. Paratypes are also in the collection of Mr. Knaus.

This is one of our smallest species and belongs in the division with *bicolor* Fab. and *emarginatus* Schfr., characterized by having a rather broad intercoxal prosternal process. From both of these it differs by being much smaller; from the former by having less strongly serrate antennæ, smaller and narrower prothorax, smaller and finer hind angles, the elytra with the striæ less sharply defined and the punctures not evident, the general surface also quite dull and granular; and from *emarginatus* by being darker, by having a smaller and more rectangular prothorax with small hind angles, more coarsely and closely punctured pronotum, as well as by a more closely punctured metasternum. Other species are separated by the narrow intercoxal prosternal process.